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MOTOR AGE

SAVANNAH READY FOR ROAD CARNIVAL

SAVANNAH, GA., Nov. 24—Special telegram—Twenty cars are ready for Starter Wagner's signal on Thursday at 9 o'clock in the 402-mile race for the A. C. A. grand prize trophy. Fourteen are foreign racers handled by Europe's most talented and experienced road pilots and six are Americans, handling as many American machines. That the foreigner has a tremendous advantage numerically is clearly evident and that he also has a handicap in the fit condition of the racing cars also is equally evident. The American cars are not ready for the fray. The Chadwick is ready, and so is the Acme. The Simplex has had few work-outs and the National developed some

F. C. BATTEY, SAVANNAH

REFEREE R. L. MORRELL

MICHENER, LOZIER

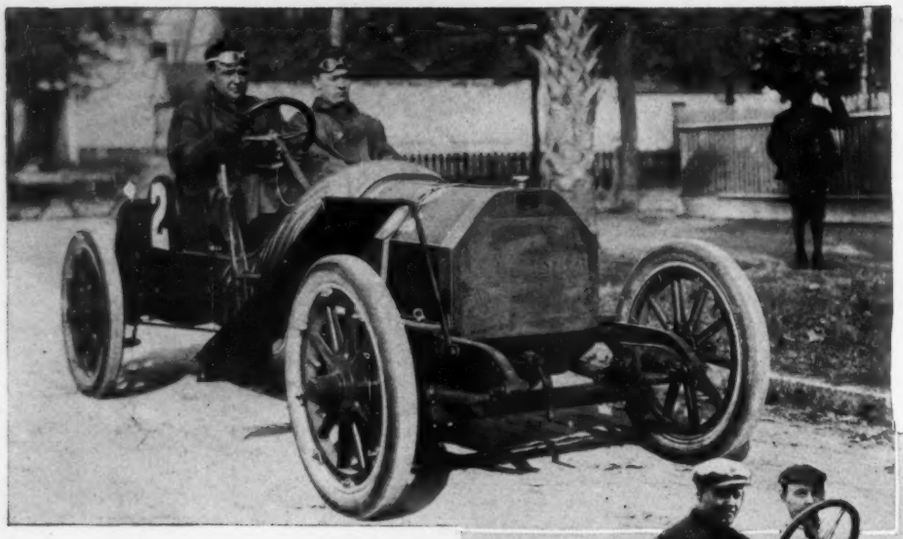
HAUPT, CHADWICK

difficulties yesterday. The Lozier cylinders are new and in need of work. The Buick has not had enough road work.

The Acme has got in shape, as was evidenced by yesterday's practice, when it made three successive laps with but 15 seconds' variation. The winning pace will not be much over 65 miles per hour because of the length of the race, rough roads and the eighteen banked turns and thirty other curves, making just forty-eight curves on each lap; in all, 768 turns for the complete course, or an average of more than 2.1 turns per minute, if the winning car averages 67 miles per hour. At present Haupt is the favorite among the Americans and the foreign fight will be among Nazzaro, Hemery, Wagner, Duray, De Palma, Hanriot and Cagno.

SEYMOUR, SIMPLEX

In the small race consisting of twenty laps around a 9.8 mile rectangle making 196 miles, fifteen cars will be started, the two scratches being the Gregoire and Aristocrat, the former because the car just reached Savannah yesterday and had transmission troubles so that George Robertson, the Locomobile hero of the Vanderbilt, refused to drive it. Twelve of the fifteen are American cars — three Chalmer-Detroits, four Buicks, four two-cylinder Maxwells and one four-cylinder air-cooled Cameron. The three foreigners are the Lancia, the baby Isotta and the S. P. O. Of these the Lancia is the strong favorite. The S. P. O. has been rebuilt since Saturday's accident and will be ready and the Isotta is an extremely small car. The Chalmers-Detroits and Buicks are looked upon to uphold American interests. The Maxwells are low-powered cars, but are expected to be running at the finish. The Cameron is

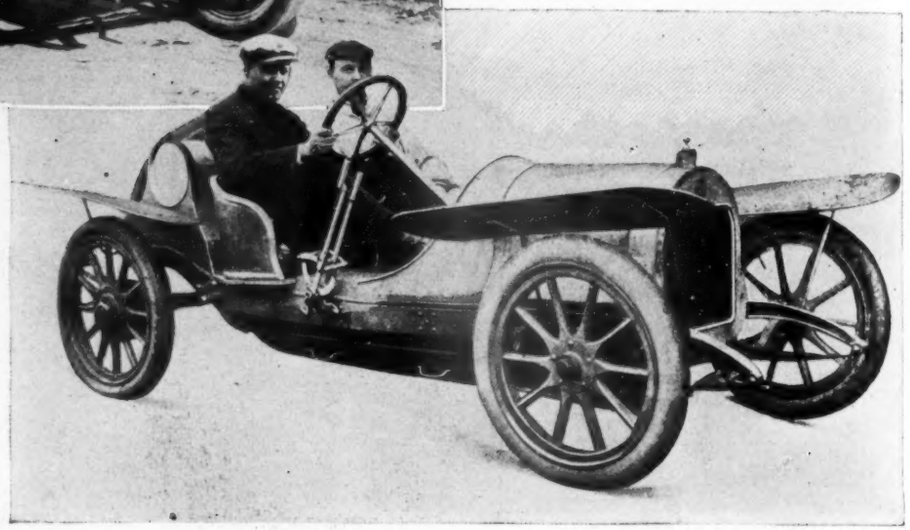


HILLIARD IN THE LANCIA CAR

small but is doing excellent work. Conditions for the grand prize race call for cars weighing at least 2,420 pounds and with a cylinder diameter not more than 6.1 inches in a four-cylinder type and 5 inches in a six-cylinder size. In weighing the gasoline, oil and water was removed, as were tools, extra tires and accessories. The stipulations governing the small car race is a weight minimum of 950 pounds and cylinder diameters of 3.75 inches for four-cylinder types and 6.3 inches for two-cylinder designs. All cars have been subjected to an internal examination in which the cylinder diameters were measured. In weighing in the Simplex was the heaviest car and Italia's next.

Today ended the practice, the time being limited to 1:30 to 3 o'clock in order to give the road builders a chance to cut the high spots off the White Bluff road. In practice this morning Mulford, when working the Lozier, hit a tree on one of the Thunderbolt serpentines and was thrown, but nothing was injured and the car was in practice this afternoon, apparently none the worse for the experience of the morning session.

Some of the times made in practice today by the big cars were: Mulford, Lozier, 27:02, 26:52; Hautvast, Clement, 25.32; De Palma, Fiat, 22.55; Harding, National, 39:03, 25:42; Burman, Buick, 23:53; Piacenze, Itala, 24:20; Cagno,, Itala, 30:30; Fournier, Itala, 28.45.



ROBERTSON IN GREGOIRE, WHICH WAS SCRATCHED

Fast Work on Monday

Savannah, Ga., Nov. 23—Special telegram—As the days grow fewer before the starting of Thursday's big race the speed average prophesied decreases. A week ago some of the sanguine wagered on 75 miles an hour; 3 days ago this had dropped to 70 and today, after having watched the majority of the big cars perform, the more conservative have placed it at 65 miles per hour. The course is rougher than generally thought and there are more turns. In an official inspection this morning eighteen banked turns were counted and thirty other turns, making a grand total of forty-eight turns calling for a speed reduction. In the sixteen laps this makes sixty-eight turns which will tax drivers and cars severely. Among the fourteen foreign drivers several stated authoritatively the winner would not exceed 65 miles per hour. High speeds are impossible with so many curves as the Savannah course possesses.

Chadwick Sets a Mark

In today's workout all of the cars but the three Italians and Duray's Dietrich were out between 1 and 4 o'clock. Haupt's Chadwick did the stellar act, making a lap in 21:06, or at 71 miles per hour, which is the fastest that has been done so far. On his second practice lap Haupt lost a tire and skidded so badly as to go over 40 feet on two wheels. He used plain tires, but has been compelled to use the Michelin studded tread because of too much oil on the course making it soft and slippery. Szisz made three laps in 23:04, 22:53 and 22:42. Erle in his Benz went the laps in 22:16 and 22:03. Strang set a pace of 22:04, 27:28 and 22:04, 27:28 and 22:05. Zengle's Acme went in 27:46, 27:39 and 27:27. Rigal in his Clement went in 24:04 and 23:29 and Michener went in 37:27 and 30:09, his car apparently being very stiff.

Seymour got his Simplex out with a new radiator, sand from the cylinder jackets having clogged the other one. He was running laps in :25 flat. Harding was late in getting to work, due to carbureter adjustment. Two days ago he decided to use a new make of carbureter, but later discovered the folly of such procedure and today had to work most of the time getting his original carbureter adjusted again. Hemery showed fast speed on one lap and then retired, apparently being satisfied with the work of his Fiat. De Palma was not out at all.

Quick Change of Tires

One of the most interesting features of today's work-out was a change of two rear Dunlop tires made by Rigal in his Clement. It was an official test announced

CANDIDATES FOR HONORS IN THE AMERICAN GRAND PRIX

No.	Car	Driver	Mechanic	Wt., lbs.
1	Clement-Bayard	Victor Rigal	Charles Gilbert	2,775
2	Lozier	Harry Michener	Tom Lynch	3,075
3	Simplex	M. J. Seymour	Tom Pepperday	3,325
4	Buick	Robert Burman		
5	Chadwick	Willie Haupt	F. G. Bremer	2,950
6	Fiat	Felice Nazzaro	F. Tagnano	2,750
7	Acme	Leonard Zengle	H. W. Freiberg	
8	Benz	Victor Hemery	Gill	2,925
9	Lorraine-Dietrich	Arthur Duray	Matthys	2,875
10	Renault	Francois Szisz	Martand	2,525
11	National	Hugh N. Harding	C. S. Kellum	2,750
12	Itala	Alexandre Cagno	Moriondo	3,150
13	Clement-Bayard	Lucian Hautvast	Chassagne	2,700
14	Fiat	Louis Wagner	Ferro	2,750
15	Benz	Rene Hanriot	Helm	2,925
16	Renault	Lewis Strang	L. Anderson	2,550
17	Itala	Henri Fournier	Rina	3,275
18	Fiat	Ralph de Palma	Bordino	2,775
19	Benz	Fritz Erle	Muller	2,875
20	Itala	Giovanni Piacenza	Cosso	3,300

at 1:30. Regal, finishing his first lap, stopped at his grand stand pit and remained in the seat with his mechanic while two tire men changed the rear rims. From the time the car stopped until it was going again it was just 31 seconds, and it would only have been 24 seconds had not the tire man on the right wheel muffed the job and had to do it over again. The Dunlop demountable rim used calls for the slackening of but one nut on a wheel which allows of bringing an eccentric into action which does the rest. A peculiar feature of it is that should the mechanic fail to tighten the one nut properly the action of the rotating wheel would do it.

Before the big car race the small cars had their practice hour and they did some fast work. The course is 9.8 miles to the lap. The little Cameron with its wire wheels and air-cooled motor did laps in 10:23 and 10:34, or at 57 miles per hour. Burman's Buick was speedy, negotiating laps in 10:57, 12:27, 14:26 and 16:40. Hearne with another Buick made laps in 10:48 and 17:22. Jeffers' Buick went laps in 10:57, 12:27 and 14:26.

The Chalmers-Detroit cars were performing in less than 11 minutes to the lap. Hilliard made slow laps with the Lancia and Al Poole made one trip.

Frank Trego, of the Chicago Motor Club, arrived today and got his electric timer installed on the home stretch for taking the time of the flying miles. Soon after the trials were over N. H. Van Sicklen's Jackrabbit, carrying a party of four, suffered a head-on collision on a serpentine turn with an Oldsmobile. Both cars were completely wrecked, but no one injured. Van Sicklen stuck to the wheel, which was broken into fragments. The collision was due to the Oldsmobile running the wrong way of the course and pulling to the left on the turn to avoid striking the Jackrabbit.

Savannah Prepares for Meet

Savannah, Nov. 22—As the day of the great race draws nearer Savannah is giving itself up more wholly than ever to the celebration of this the greatest event in her new ecru history. The business section of the city is hung with Automobile Club of America colors and most of the cars about town bear the club's bannerettes. Savannah's whole heart is in this race and no one would so abuse hospitality as to intimate that the coming contest is not to be the greatest ever run in this or any other country.

Savannahians have above all an ambition that Thursday will see a new world's record set up. It is hard to convince them that with nineteen right angle turns on the course, with several stretches of pretty rough going for racing cars, and the stops necessary for tire changes and fuel replenishment in so long a contest as 400 miles it is unreasonable to expect an average rate of 70 miles per hour.

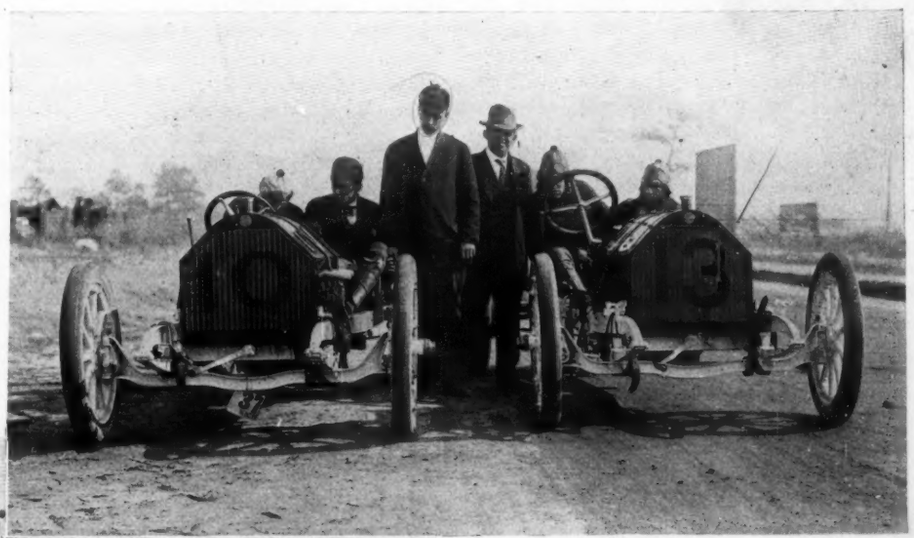
The Savannahians have spared no expense and left no stone unturned to improve on their excellent arrangements and management of last spring. They have built a new and larger press stand and erected west of the old stand a new stand with a seating capacity of 10,000. The capacity of the old stand was also increased to 6,000. Eleven telephone stations have been established connected with the score boards facing the grand stands and parting spaces. Along the front of the old stand, which is really the grand stand, the new stand being in the bleacher class, supply pits have been dug.

Chatham county has borne the expense of building the new roads and the city of Savannah has resurfaced the roads within the city limits. The Savannah Automobile Club erected the grand stands and telephone lines and will pay the flagmen. The profits of the race will go to the advertising fund of the city. The Automobile Club of America will not receive any of the race receipts, though at different

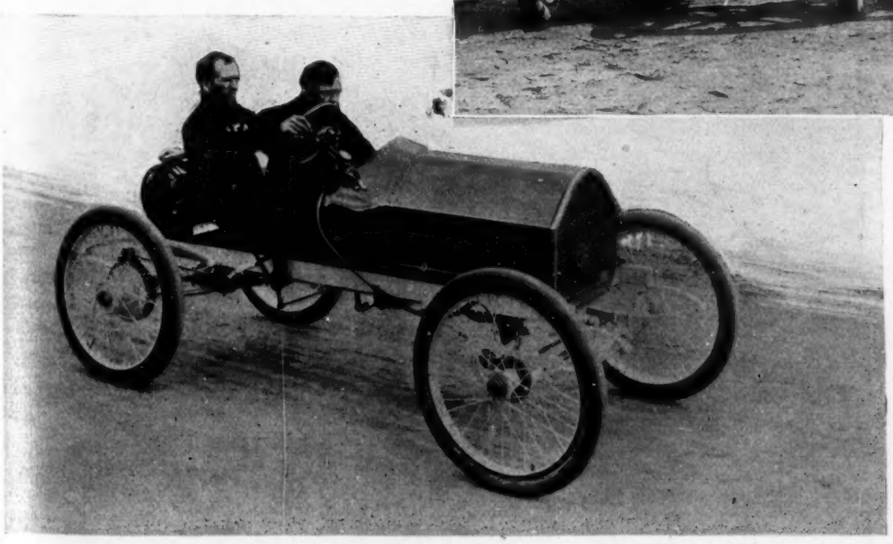
FIELD IN THE LIGHT CAR RACE AT SAVANNAH

No. Car	Driver	Mechanic	Wt. Lbs.
1—S-P-O	A. Connors		
2—Lancia	W. M. Hilliard	Frank Strobel	2,000
3—Chalmers-Detroit	L. J. Bergdoll	Charles Howard	....
4—Am. Aristocrat	K. R. Manville		*
5—Cameron	F. I. Cameron	J. J. White	1,125
6—Isotta	Al. Poole	W. Fehr	1,500
7—Gregoire	George Robertson	G. Ethridge	*
8—Buick	R. Burman		1,500
9—Maxwell	A. See	Carter	1,525
10—Chalmers-Detroit	L. B. Lorimer	J. H. Stickney	....
11—Buick	E. A. Hearne	J. Tower	1,475
12—Maxwell	Costello	J. R. Cleland	1,175
13—Chalmers-Detroit	W. R. Barns	R. R. Gareau	1,900
14—Buick	E. Easter	F. A. Thompson	1,500
15—Maxwell	J. Muntwyler	Michelson	1,125
16—Buick	J. W. Jeffers	W. C. Mahoney	1,550
17—Maxwell	Carl W. Kelsey	H. Cawood	1,450

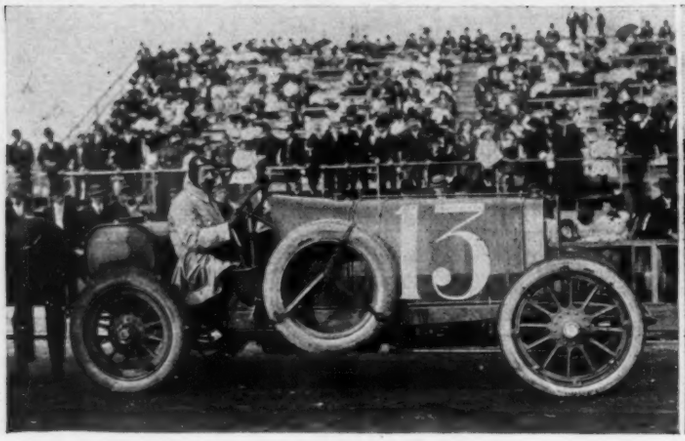
*Scratched

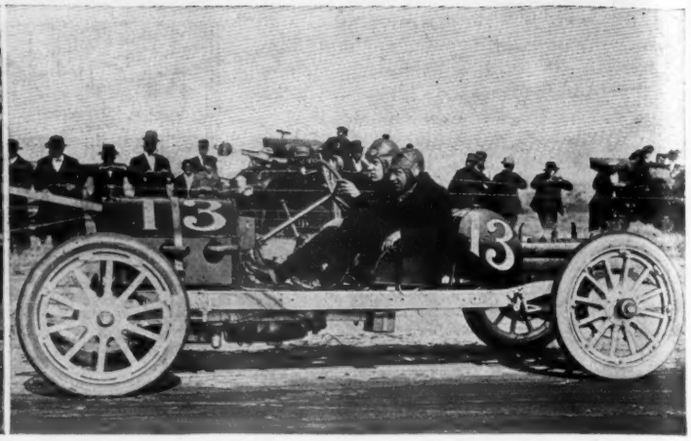


TWO OF THE CHALMERS-DETROIT TEAM



CAMERON IN THE AIR-COOLED CAMERON





THE CLEMENT-BAYARD —TWO NO. 13s— THE CHALMERS-DETROIT

times it is reported to have received appropriations amounting to $7,000 toward the cash prizes and other purposes. All other expenses attendant on the conduct of the race itself relating to the publicity and the contest committees, and the cost of the $5,000 gold cup are borne by the New York club.

Two serious accidents have marked the preliminary practice, one fatal and the other also possibly with death as its outcome on Friday as the S. P. O. was speeding up the White Bluff road near the Buick camp. John Juhaaz, as driver, in trying to avoid a dog, swerved to the side of the road, gouged a big piece out of a tree and then dashed into a telegraph pole. The crew was hurled from the car. Marius De Rosa, the mechanic, had a fractured skull and other injuries, and died shortly after reaching the hospital. Juhaaz escaped with bruises. The car was not, however, hopelessy wrecked. It is now at a repair shop with hopes of its still being able to take part in the light car race with either Phil Adams or Connors, who was Stricker's mechanic in the Vanderbilt race, as its driver.

The other accident occurred in front of the Buick camp during Wednesday's practice. Robert Burman was driving a light Buick when its left rear tire blew out. The car skidded into a telegraph pole and was completely wrecked. The mechanic, Joe Grinnan, had his skull, elbow and six ribs broken. One rib punctured his lung and pneumonia has set in. Burman escaped without injury.

Description of Course

The course is not so much faster than it was last March as many outsiders had imagined and as the public and press had given it out to be. It is true many of the turns have been banked, there being nineteen banked right-angle turns in the 25.13 miles, but several of these are just as they were last March; it also is true that in two places great improvements have been made. One of these is in the Isle of Hope district, where the course swung left at 90 degrees only to again swing right and come back into the course. Here two turns are eliminated by cutting the road through private property. A little further on in this district marked improvement has been made on the two close-together turns on one of which the Apperson upset last March. The banking in both of these has been vastly improved by cutting a new right-of-way at both turns, forming an S curve. Several of the other turns have been banked more than at the first races.

Apart from the banked turns the course is not so fast as the public has been led to expect it was. On the White Bluff road are two rough stretches, one of ½ mile length and the other on well toward the end of this stretch and not of more than half this distance. To make matters worse on this 3-mile straightaway stretch the road is too heavily crowned or arched, which will reduce speed. Of the new triangle which is made up of Whitefield avenue and the Montgomery road on one side and the much-talked-of Ferguson avenue on the other. The Whittaker and Montgomery stretches are rough, but have not come in for much criticism from the drivers. This stretch is full of curves, has little straightaway and while it can be negotiated at fast speeds it is not going to add to the general speed of the course.

Too much cannot be said about Ferguson avenue, the other side of this new triangle, and which within the last 10 months has been cut out of the virgin forest and made into one of the finest speedways in America. It is as straight as an arrow for nearly 4 miles; it is broad and level and the pace set is only limited by the capacity of the machines. Owing to the new roadbed it is not expected that this stretch will prove so fast as Dale avenue, comprising the 4-mile straightaway on the home stretch.

The Isle of Hope is as of yore a tortuous right-and-left curve affair with the road one instant skirting the shore of the river and on the next cutting through the front yard of an enthusiastic motorist. The increase in many of the bankings on these curves will add miles to the average pace.

Error in the Banking

A slight error was made in forming many of the banks at the start by not continuing the bank round enough to hold the car from a skid on its final straightening up. It was due to a situation of this nature that Burman in his Buick overran one of the turns that from the White Bluff road onto the Montgomery crossroad a week ago. Since then, however, many of the bankings have been lengthened with most beneficial results. The trouble that is going to happen on some of these turns is that many of the cars are going to cut them too close. If they do the wheels will get into soft grass; already one or two have come near trouble because of this. To guard against it N. H. Van Sick-

NATIONAL SIX, WITH HUGH HARDING AT THE WHEEL

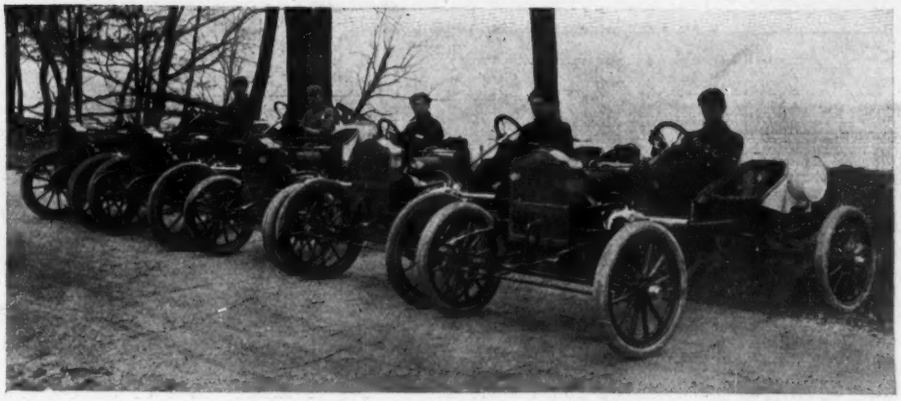
len, Sr., who has the superintendency of the preparation of the course in charge, has placed oblong blue banners carried on a couple of 3-foot stakes marking the inside safety point of these turns, but in spite of these the drivers persist in cutting close and running down the banners. Banners of this nature are placed along the course to indicate danger points such as drops at the end of bridges, narrow places and soft spots that are located along the side of the road.

Comment on Banked Turns

It is interesting to hear the comment among the drivers on the banked turns. Many of the foreign drivers are averse to them because they are not accustomed to them and having learned the art of taking flat turns at high speeds, feel that these banked turns do not really make their performances as brilliant as if they were not banked. On the other hand, Haupt with his Chadwick and Seymour with his Simplex are experts at the banked turn art, because of experiences on circular tracks, which will count greatly in their favor during the contest. The big car drivers hold to the bottom of these turns but there has been too much taking of them a little wide by many drivers in the light car event.

When computing on record-making time over the course it must be remembered that there are not a few places on the circuit on which it is impossible for one car to pass another at speed and that the faster will have to do a little trailing before executing the pass which will reduce the average speed not a little. These districts occur in the Isle of Hope and Thunderbolt districts as well as at points on Whitefield road.

The course is ready for the day of the gladiatorial contests, one of the electric road crossings having already been removed and the work on removal of another nearly completed. The telephone arrangements are practically finished also, N. H. Van Sicklen having selected the places for the eleven stations around the route, had the equipment installed and all wires placed. Closely associated with it is the location of the ambulance headquarters.



MAXWELL'S FLEET OF LITTLE CHAPS

One hundred and thirty-four flagmen are used in signal work. Using the yellow flag means danger the red flag clear course. Each of these 134 men is on the job each day during practice, so that they will be in perfect control on the race days. Also scattered along the course will be 500 soldiers guarding the course, which lies outside of the city of Savannah limits and within city limits city police will be in control. The instructions to the militia are to be diplomatic and courteous at all times, but to keep the course clear, and it is expected that the big record of clear courses established in March will be again duplicated and perhaps improved upon. Greater precaution will be taken in keeping the crowds away at the turns, where wire fences are being erected and along the Isle of Hope district spectators will not be allowed between the course and the river, where the road winds close to the stream.

What Happens to the Cars

It invariably happens that after cars reach the course a vast amount of work has to be done upon them, even if they had been previously turned up. This is the main reason for early arrival on the course and it is somewhat regrettable to know that the foreigners were the first to get on the circuit, which, together with the well worked-out condition the cars were in should be a big advantage. Early on the course means getting the car into the best shape and also giving the man a good opportunity. Haupt in his Chadwick has had a lot of work to do. The stock car he will pilot was driven from the factory to New York before shipping to Savannah and when outside of Philadelphia got in a mix-up in which the front axle was bent, a spring broken, a rear wheel broken and the transmission and rear axle damaged. Time has been needed to overcome this disadvantage and by herculean efforts the car has been got ready and has made laps in 22:41 and 22:25. Haupt will, it is expected, put up a wonderfully determind race and the wish of everyone is that after his hard luck in the Vanderbilt he will be privileged to be one of the early finishers. Seymour in his Simplex has had ill luck. This car is the same one with which he won the 24-hour race excepting that larger cylinders are used, having 6 1-10-inch bore and 5¾-inch stroke. The sand was not well removed from the cylinder jacket cores and after some time it got into the radiator and gave trouble. The matter has been rectified by getting a new radiator. The National camp was slowed waiting for the Michelin rims and the wheels carrying them and after their arrival brake and carbureter adjustments were imperative. The Chalmers-Detroit cars have been indulging in hard workouts and one, due to breaking of a piston, had to have a new set of cylinders fitted.

AT THE RENAULT CAMP —SCENES AROUND COURSE— SZISZ AND STRANG

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MOTOR AGE

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Passing of Road Locomotives

AMERICA will witness few more road races among the giant gasoline locomotives that makers delight in calling 120-horsepower machines, and which gladiatorial monsters thrill everybody by their electrical dashes along the stretches and their mystifying behavior on the turns. The demise of these picturesque racing monsters will be regretted by a few who may imagine that the days of high speed are waning and the evening is close at hand. Far from it, the speed will remain, but only the monster will depart. The monster will depart because smaller but more efficient motors will take up the burden and maintain as high if not higher speeds. The smaller car will maintain higher speed for two reasons, first because of better motor design, giving greater efficiency and second because of less wear on tires and fewer changes needed. This is not a Utopian conception born within the four walls of the editorial sanctum, but a bare, bold, hard fact that makers are agreeing upon more and more as the days go by. Everybody realizes the waste in the big engine and the wear on tires and roads. Makers also realize the expense of building these special speedy giants and the cost of maintaining them. What is coming is the small car, the stock car, with body off and which when on the road can make as high as 60 miles per hour. Motor enthusiasts will buy duplicates of such whereas they would refrain from buying a replica of the larger car.

Small Car Races Coming

THE Frenchmen have tired of big road racers and are talking only of voiturette races, and it is a safe prediction that America will throw the majority of its influence with the small car performers. In order that small car races in America prove successful it will be necessary for more makers to enter, so that the race will prove a really representative one. With but two or three manufacturers entered, a race is far from one of national caliber, but with a dozen or a score of makers represented it would be of the national character which an American small car race deserves. With the development of small car races must come the use of American-made tires, which means meeting the foreigner in the demountable rim proposition. Demountable rims must be developed that will make 30-second tire changes possible and without such it is impossible for a car to compete against another on anything like an even basis. An American entry should have an American magneto, American tires, American demountables, American drivers and American brains. This combination will prove a winner.

Performances of Light Machines

IT WILL be recalled how successful have been the voiturette races abroad in which small one and two-cylinder cars have demonstrated it is possible to average 50 and 55 miles an hour without building road locomotives to turn the trick. In this country we already have seen the speed demonstrations of the smaller cars on the Long Island motor parkway in which American-built machines ranging from 18 to 30 horsepower performed most creditably. The light car race at Savannah brought together a representative lot of cars, which represent nine different makers, showing that the manufacturers are reading the handwriting on the wall, even if the motoring public is slow to realize the trend of the times. The future would seem to hold forth a fine opportunity for the trade to demonstrate that special-built racers are not needed to prove the speed claims of the modern motor car.

Licenses For All the Slogan

DRIVERS of all vehicles should be licensed. Then police control of traffic in New York and other large cities would be as absolute as it is in London, where the finger of the "bobby" can stop the progress even of a king. That is the idea of an ex-police commissioner of the metropolis, and the common sense of the proposition is so apparent that it is strange the plan has not been duplicated in this country before. In the large cities, and especially in New York, Chicago, Boston and Philadelphia, street traffic of all kinds has assumed such huge proportions that the dangers to the users of the road have multiplied astoundingly, as is shown in the increasing number of accidents. If "every driver of any kind of a vehicle" had to have a license, which was revocable temporarily or permanently, there would be more consideration and a quick decrease in recklessness of those entrusted with the guidance of horse-drawn or motor-driven vehicles. Before a law of this sort can be put into effect in the average American city, there inevitably must come the creation of a sentiment in favor of it which will convince the politicians that the general public demands it for the common good. There will come a prolonged resistance from the thousands who now guide horses through the crowded streets without any examination as to their qualifications and whose utter incapacity frequently finds demonstration in the accident reports in the daily papers.

Motorists Should Assist

BUT the motorists should no longer hesitate to place themselves squarely on record as being in favor of licensing all drivers and the revocation of such licenses for culpable conduct in their use of the streets. The public has been long suffering, but has reached the limits of its forbearance, according to the signs of the times, and while purging their own ranks, the motorists can see to it that the drivers of horses are included among those who must give more consideration to one another and the man who must cross the road to get on the other side of the street. It is by such consideration that the motoring fraternity can dispel the prejudice that exists to a certain extent among citizens who do not possess motor cars and who imagine the motorist has nothing but contempt for them because they are on foot and that the toot of the horn is an arrogant demand for the right of way over the public highway, whereas, on the part of the motorist, the sounding of the horn is simply to warn the pedestrian who generally ambles across the road without giving heed to approaching vehicles. Often it is the case that when the horn is not sounded the pedestrian indignantly asks why it wasn't and if it is he becomes angry because he is startled out of his absent-mindedness. It will require considerable forbearance on the part of both pedestrian and motorist to make each realize that each has an equal right on the road, and that the motorist is striving to keep the pedestrian from wandering in the path of danger.

Universal Lights Law Needed

WHILE on the subject of road courtesies and dangers, it might not be out of place to remind the motoring world that a universal lights law throughout the counry is needed almost as much as federal registration. Motor cars are compelled to carry lights at night and this is insisted upon in all sections of the country, but such is not the case with other vehicles. Everyone should carry lights at night and there should be two in front and a red danger signal behind.

WOULD LICENSE DRIVERS OF ALL VEHICLES

NEW YORK, Nov. 22—William McAdoo, a former New York city police commissioner, and before that assistant secretary of the navy and also a congressman, was one of the speakers at the recent presentation of the Vanderbilt cup. In his witty and novel, interesting speech, Mr. McAdoo devoted his remarks largely to the traffic problem and a discussion of how the inevitable and lasting motor car was to be regulated by law. He declared that the solution of the question lay largely with the motorists themselves, who had the power to compel reasonable laws and should have the public spirit to obey them.

"I do not know whether it was Shakespeare or Roosevelt who said that men must play many parts," said Mr. McAdoo. "I have been a legislator, a sailor and a police commissioner. I must say that I felicitate myself that I am no longer a police commissioner when I gaze upon this assemblage of 300 law-breakers, with an average of $100 in fines. I am prouder of what I have done to regulate traffic and make the streets safe than anything I may have accomplished. I am proud to have been the one to have established the Brooklyn bridge safety zone which now exists.

"I have been studying traffic control in London this summer from a New York point of view. You motorists and the burglars' union are trying to undo the police. I am getting more acquainted every day with the under world, for you motorists are the greatest aggregation of law-breakers on earth; I will say, however, you are a fairly intelligent lot of law-breakers. One of my first acts as police commissioner was to change the caps of the bicycle cops to white. Then the West End Association gentlemen came and told me that the motorists would see the white caps and slow down, and I replied that that was just why I put the white caps on the cops, and if I were police commissioner now I'd put red lights on them at night."

ONE OF A. M. C. M. A. SHOW STATUES

Mr. McAdoo then recited a hold-up that the Riverside cops had once made on him and used it as a text to show how policemen seek to get a record and square themselves for not being on their jobs by filling up a record of arrests made.

"Efficiency in a cop," he continued, "does not consist in making arrests, but in showing good judgment. My idea is to let motorists hit it up a bit when the road is clear and hold them down under the limit when the children are coming out of a schoolhouse. (Great applause.) I don't believe in police traps or making arrests. I want the policeman who makes no arrests, but who is on his job all the time he is on duty.

"The London rate of speed is higher than our own, despite the more crowded traffic. One-fifth of our accidents come from violating the law in turning corners. In London they make them turn the corners wide. Our own corner curbs are ground down by illegal short turning. Homecomers tell of the power of the upraised finger of the London bobby.

"The reason for this is that in London every driver of any kind of vehicle is licensed. When you ask him to show his license, you have command of the man's living. To regulate traffic in New York properly we police will have to get absolute control of the streets. The mounted cops are the first, the greatest step in this direction. We need to get civilization out of barbarism. The motor car is a part of our civilization of today. It is here to stay and you yourselves must be the ones to curb the reckless chauffeur.

"I believe that the American motor car is to be the motor car of the future. In the early days of bicycling it was more fashionable to ride a Humber. That was all changed, and with our motor cars as with our bicycles we will dominate the world, and before long, mark my word, it won't be fashionable to own a foreign motor car."

COMING AMERICAN SHOW DATES

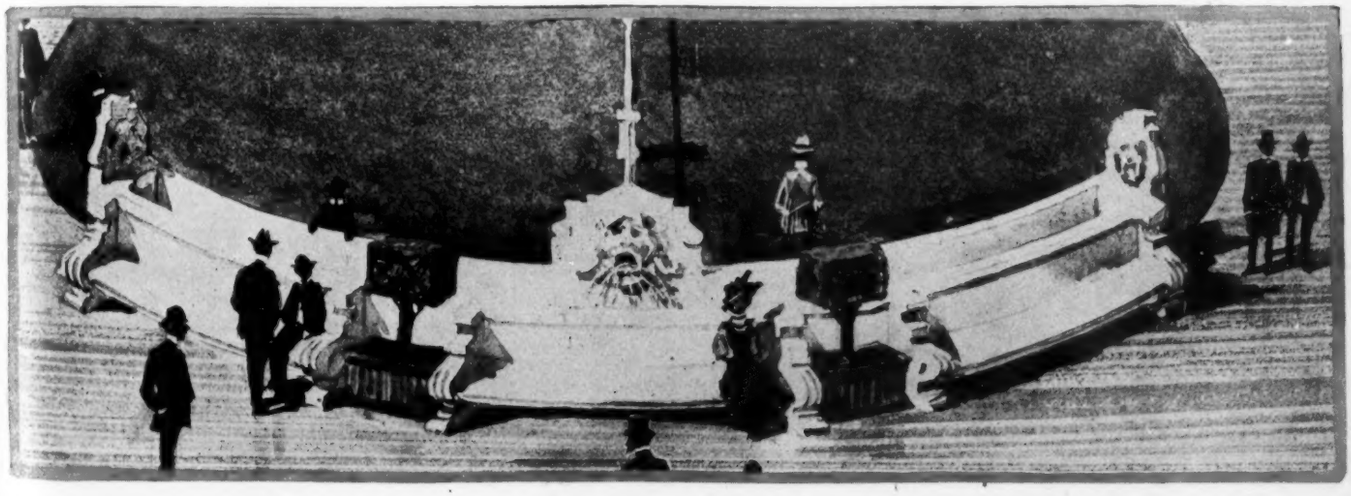
Palace Show—Ninth international show, conducted by the American Motor Car Manufacturers' Association with the Importers' Automobile Salon and the Motor and Accessory Manufacturers, Grand Central palace, New York, December 31 to January 7.

Garden Show—Ninth annual show of Association of Licensed Automobile Manufacturers, Madison Square garden, New York, January 16-23.

Philadelphia Show—Annual show of Philadelphia Automobile Show Association, Second Regiment Armory, Philadelphia, week of January 27-February 3; J. H. Beck, Odd Fellows Temple, manager.

Chicago Show—Annual N. A. A. M. show in Chicago, February 6-13.

St. Louis Show—Annual motor car show in St. Louis, February 15-20.



DESIGN FOR ENTRANCE WAY TO THE A. L. A. M. SHOW IN MADISON SQUARE GARDEN, NEW YORK

FEATURES OF THE SEVENTH OLYMPIA SHOW

LONDON, Nov. 13—The Society of Motor Manufacturers and Traders opened its seventh annual pleasure vehicle show at Olympia this morning under the patronage of the king. Unlike previous years, there was no opening ceremony, but there was no lack of visitors in consequence, and from the opening hour of 10 a. m. a steady stream of better class visitors made their way in. This of itself marks a distinct change from former shows, when the first days have not attracted much attention. Already good signs of business are apparent and the end of the first day finds the general body of exhibitors in an excellent humor.

In all past exhibitions the racing car has been a big attraction, and the stands that included the battered victors of the season's speed contests always attracted interested crowds. This is to be no more, for, complying with the public opinion—or that section of public opinion which is represented by two or three noisy half-penny papers—the promoters decided that anything that savored of motor racing must be banished forthwith. Hence it is that the hall today contains neither racing car nor is any literature permitted to be distributed that appertains to so terrible a sport! But while many will be found to criticize the promoters' action in this respect, the majority both of exhibitors and of purchasers will probably agree with the decision to abandon trial rides.

Demonstrations Are Abolished

The experience to be gained in a few minutes' ride round the building would not materially influence a purchaser, and yet such runs have in the past been a big source of trouble and expense to the exhibitors. The serious purchaser can now make a definite appointment for a more thorough test and the only person that will be disappointed is the man who is accustomed to go up to Hammersmith for an afternoon's outing in the cars.

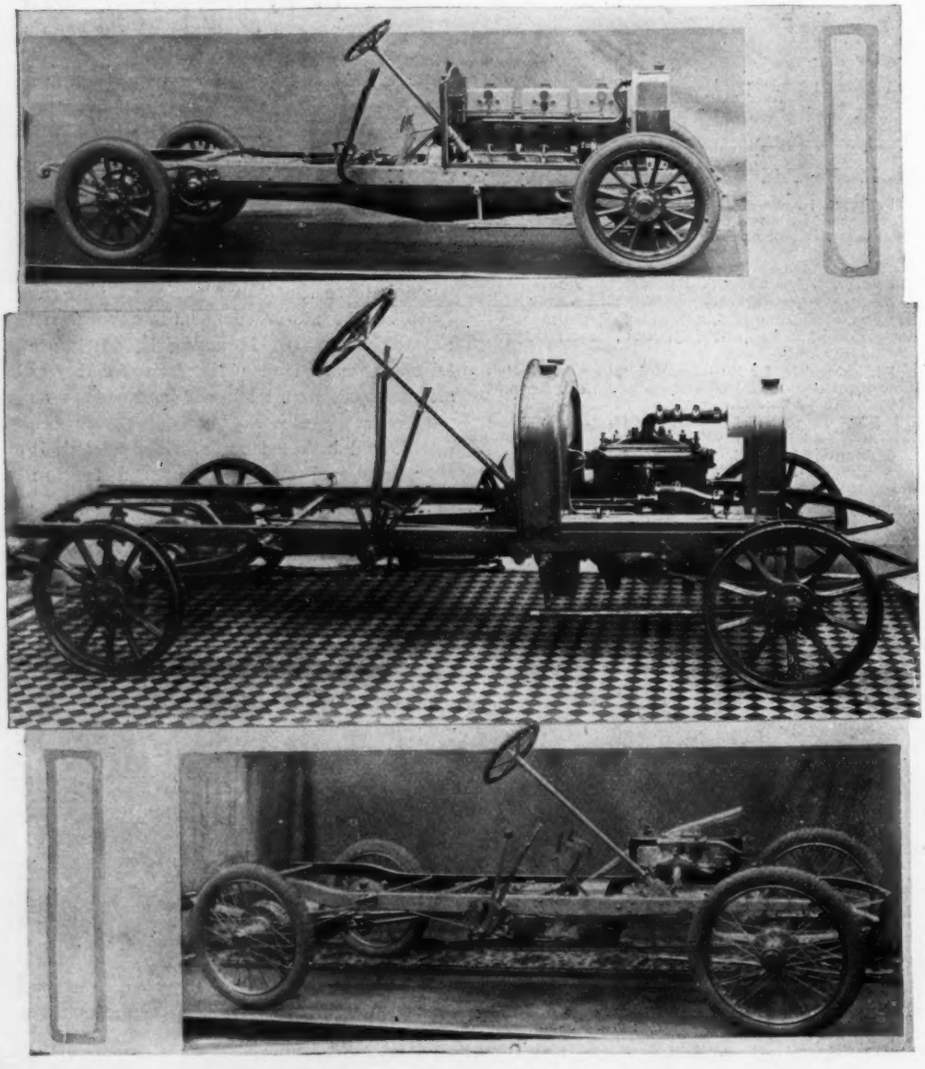
Everywhere can be observed the tendency toward reduction of noise. Just as a year ago engine flexibility and the perfection of the lubrication system were the aims of the designer, so now noiselessness is the feature on which greatest stress is laid. In the case of the Daimler-Knight valveless engine absolute silence of operation is put forward as its biggest advantage. Numerous other makers retaining the mushroom valve engine have adopted the plan of covering the whole of the valve arrangement with an aluminum plate and also of altering the form of the valve-lifting cam. Throughout the rest of the car this quieting process is apparent. The exhaust long ago ceased to be objectionable, so now the incoming gases are silenced, the Daimler and Iris carbureter being prominent in this respect. The gear pump has been replaced on several cars by the smoother-acting centrifugal variety, or, better still, has been omitted altogether, the natural circulation being now relied on. Other instances present themselves in this refining process, and if for the next show designers will but consider the question of reducing the dust-raising properties of their cars, the public will have little to complain of.

Of general tendencies of design much is apparent. During the past season the various voiturette races in France and the "4-inch" race in this country have shown what excellent results can be obtained from a well-designed and carefully constructed small car. As a result there is a big increase in the number of such cars staged, these being frequently met with on the stands of the best-known makers.

Small Fours Are Popular

The single-cylinder engine has almost lost its premier position by reason of the popularity of the small four-cylinder variety, in which the bore is as little as 65 millimeters—this being the case with De Dion and Martini. Even the six-cylinder engine has found its adherents, and such cars as the 12-horsepower six-cylinder Delaunay-Belleville are well worth inspection. Interesting examples of these small cars will be detailed later.

A second feature of note in engine construction is the re-introduction of the twin-cylinder type. At last year's show this form of engine had almost entirely disappeared and engine types seemed definitely to have resolved themselves into the single, the four, and the six. The popularity of the engine of about 10 horsepower has now led to the feeling that something between the one and the four is required, so that the twin-cylinder engine is likely to have a greater vogue than ever. Hardly less noteworthy than the increase in the voiturettes is the prevalence of the 4-inch engine—usually with a 5-inch stroke, but tending, if anything, to exceed this. The increased power given by these small engines is well indicated by the generous provision of covered bodies on such cars, whereas in former years nothing smaller than a 30-horsepower 4½ by 5 engine was considered



GOBRON-BRILLIE, DELAGE AND THORNYCROFT CHASSIS

sufficiently powerful for a limousine or full-sized landaulet. As a natural result the bigger type of car tends to decrease in numbers, and by next year this decrease should have assumed definite proportions. Beyond the big car there still exists a class which is to all intents and purposes a racing car with a small and uncomfortable touring body fitted. Among cars of this type that are on view may be noted the 100-horsepower Germain and the 90-horsepower Napier, Fiat and Gobron-Brillie.

Long Strokes Are Common

The general success of the long stroke and high piston speed engine in the "4-inch race" showed itself almost too late to affect the present models. This tendency, however, can be observed in the case of the smaller cars, where the stroke is between one and one-quarter and one and one-half times the bore. Apparently not a single car in the show has an engine with stroke less than the bore, a change from last year, when several examples of the 4 by 3 and 5 by 4 type were staged.

Cylinders all cast in one block now find general favor. The former big objection of excessive cost of replacement when a cylinder was damaged is greatly discounted now that the public realize that cylinders do not require replacement every few months. From the maker's point of view the saving of space, as well as the general simplification of the piping and water connections, make the block casting a favorite.

In the Deasy 15-horsepower model, as in the 18-horsepower Ford, this method is carried even further, and the top half of the crankcase forms one casting with the four cylinders. This design makes a very neat job, indeed, and by casting the supporting arms in aluminum and bolting to the engine casting, the latter is kept from becoming unduly cumbersome.

Ball bearing engines have not increased in numbers and the practice may therefore be regarded as still under trial. In other parts of the running gear the ball bearing is almost universal.

The general introduction of forced lubrication systems was a feature of last year's exhibition, and to such an extent has this commendable practice been carried that now the splash system with drip feed is retained only on the cheapest type of voiturette.

Carbureters are still far from settling down to uniform design, and hardly any maker has retained the 1908 carbureter without change. The two and three-jet type is frequently met with, but the uncertain spring-controlled devices are still in great numbers. On the Daimler three-jet carbureter a water-heated silencer is fitted and the tout ensemble is found to give very excellent results.

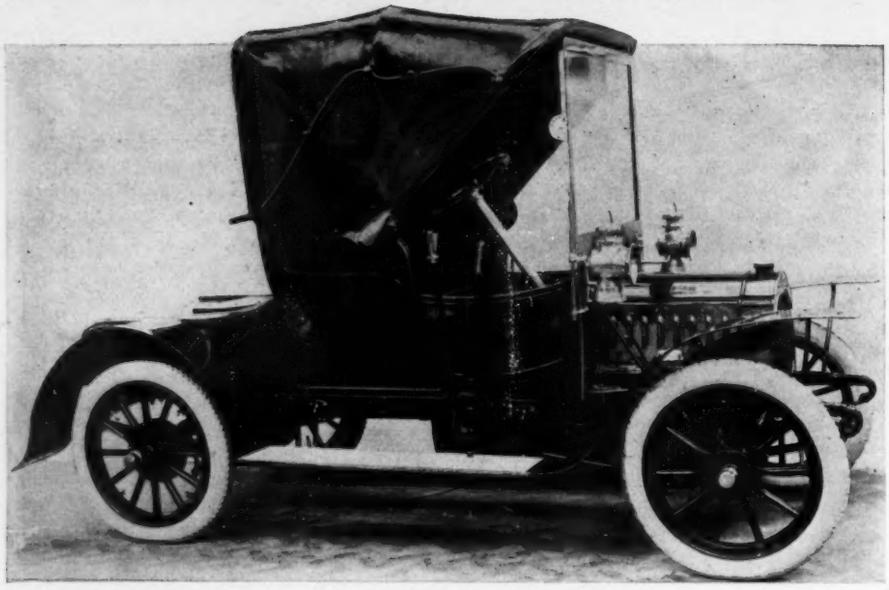
A year or two ago the pressure fuel tank at the rear seemed likely to disappear, its two enemies being its liability to choking of the pipes and its alleged dust-raising qualities. The latter has in general been disproved by the Royal Automobile Club experiments, while the first named trouble is obviated by dispensing with the exhaust gas and employing in its stead air pressure from a pump driven off the camshaft. The fact that this air pump might be made larger and used to operate a self-starting system does not seem to appeal to the generality of designers and but a few cars—the S. C. A. T. and the 60-horsepower Fiat for example—are so equipped.

Few Self-Starters Shown

The many other forms of self-starters so eagerly brought forward 2 years ago have all entirely disappeared from view. In the ignition section the high-tension magneto is almost universally employed. Even the low-tension variety has finally lost its popularity with the Italian cars and is not found save on a couple of Fiats. In spite of the fully-proved reliability of the magneto, however, there is still a general practice of fitting an accumulator and coil system as a standby, but whereas last year this was invariably of the high-tension distributor with one-coil type, several makers have this year used the low-tension distributor with a special four-unit coil having but a single trembler. This is found to give the good synchronization of the former type with less cost and insulating trouble.

A general—and necessarily hurried—

GENERAL VIEW OF THE OLYMPIA SHOW ON OPENING DAY



De Dion 9-Horsepower Two-Passenger Victoria

examination of the cars leads to the conclusion that clutches are in the same position as last year, as far as popularity of the rival forms goes. Several new makers fit the disk clutch, and particularly is the new Hele-Shaw clutch remarkable in that all parts, save the phosphor bronze outer plates, are of pressed steel, thus affecting considerable weight-saving. On the other hand one or two makers, including Austin and Weigel, have reverted to the leather cone clutch, so that the balance of power is almost unaltered. The other types of clutch, whether of the expanding or the contracting variety, have almost disappeared, and the Motobloc and the Mors are probably the sole remaining exponents of the two types. The use of cork inserts has not yet come into favor on this side.

Meanwhile the hydraulic clutch is being quietly worked out, and it is said that by the next show a satisfactory example will be exhibited of this combined clutch and gear which would seem likely to oust altogether the present unmechanical devices.

Question of Gearing Satisfactory

The gearing question now seems to demand but little attention and most of the cars have the form of three or four-speed gear box, which has served them for several years. The use of third direct and an indirect fourth gear, a feature of the last show, has but few fresh adherents.

It was rumored that several Panhards of new and popular power would be shown, fitted with the epicyclic gear. This, for a well-known French firm, would be sufficiently a novelty to cause comment, but the non-appearance of these cars makes it necessary to await the Paris show for further information.

In spite of the flexibility of the six-cylinder engine, only one maker has been found to dispense with the gear-box. The 45-horsepower Sheffield Simplex has this feature to recommend it, but even here a reverse has, of course, to be fitted, and while arranging for this in the rear axle casing, the makers have thoughtfully added a low forward speed "for emergency use," so that the novelty of the step rather disappears. All the same this proceeding effects an appreciable saving both in weight and in the number of parts, and the increased simplification of the chassis is certainly surprising.

Several other makers—notably Napier in his smaller cars—have arrived at a similar result by moving the gear-box up to the engine, of which the flywheel is placed right forward against the radiator. As will be shown later, the Napier gives a very neat and simple car, but it is questionable whether this simplicity of appearance is not obtained at a too-great sacrifice of accessibility.

Chain Drive Dying Out

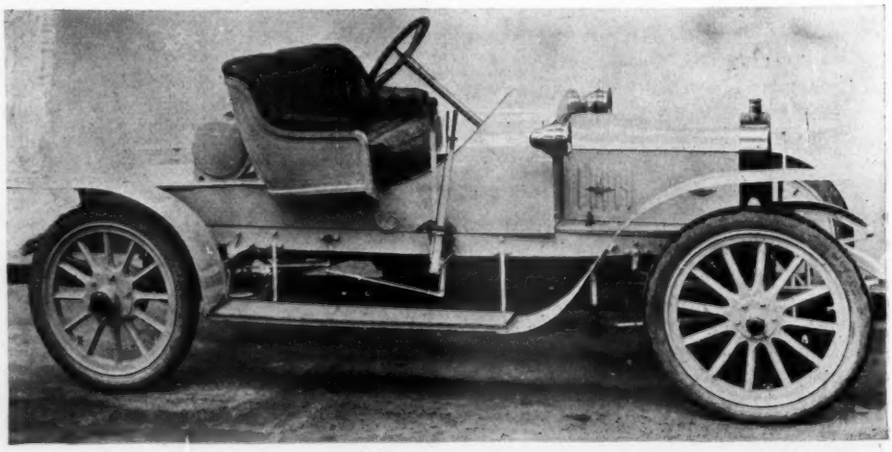
For the final drive, there can be no doubt but that the chain is dying out, except for the highest powers, and here again it only shares the honors with the shaft-drive. In its turn the shaft and bevel drive is rivalled in medium-powered cars by the worm drive, and another year will probably show a big advance in popularity of this last type, which, when well designed and cut, possesses such advantages over other forms of gearing as regards quietness and smoothness of action. Almost all cars retaining the chain drive that are exhibited have well designed oil-tight chain cases, a feature which at once removes the greatest objection to this form of drive.

In the rear axle itself the straight tooth or spur differential shows an increase in use, so that the bevel wheel thus tends to disappear from motor car practice altogether.

But little change is apparent in frame design, which still adheres to the pressed steel form. What alteration has been made is in the direction of lowering the height at the rear so as to accommodate the covered body, which increases greatly in popularity each year.

As a concluding feature, the popularity of the wire wheel on all types of car must be recorded. The wire wheel always has had several firm supporters, of which the Lanchester, that origin of so many new ideas, was perhaps the most prominent. Two years ago, however, the Rudge-Whitworth detachable wire wheel opened up a new range and since then this more mechanical device has spread to an extent that may be judged from the fact that such firms as Daimler and Napier, along with a dozen others fit Rudge-Whitworth detachable wheels as standard on all models. It certainly requires some time before the eye becomes accustomed to the wire wheel, but once the novelty has worn off, its many advantages, including those of lightness and strength, greatly favor its general use.

With the known falling off in the demand for the larger-powered cars and the big increase of competition in the smaller section, it was generally anticipated by the public that a general drop in prices would be manifested. This has not been the case and although in certain instances prices are slightly below those of last



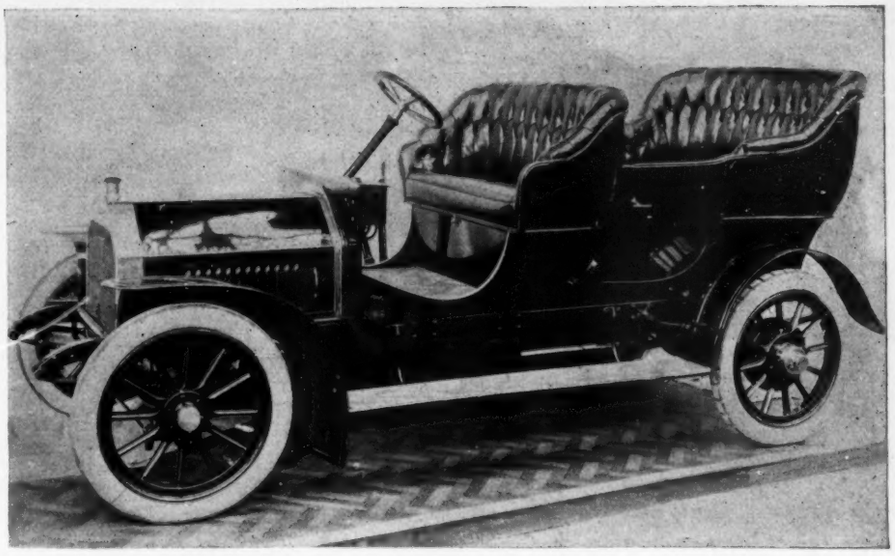
Vauxhall Roadster, Four-Cylinder, 16-Horsepower

season, the usual rule seems to have been to improve the details and so to keep the price up to its former level. By the introduction of new low-powered models, however, many of the biggest makers—such as Napier, Austin, Delaunay, Fiat—have now brought their productions within the reach of that immense section of the community, "the man of moderate means."

Some British Cars at Olympia

For most visitors the first stand to be inspected will probably be that of the Daimler company, which, by a curious coincidence, occupies the center position of the building. When 2 months ago the Daimler company announced its intention of adopting the Knight valveless engine exclusively for the coming season, there was much criticism of their action, many believing that the firm had been too precipitate in deciding to concentrate on these engines right away. Mr. Knight's descriptive paper before the Royal Automobile Club a few weeks ago and the publication of the results of extensive tests that have been made, have led most people to believe that this engine marks the commencement of a new era in motor construction—for in addition to demonstrating the advantages which such an engine offers for the four-cycle motor, the new engine has directed public attention to the possibilities of the two-stroke motor, to which class the Knight engine was at first erroneously supposed to belong.

Further on, the Sheffield-Simplex is an example of several similar high-class six-cylinder cars, but in itself it is remarkable in that it has no gearbox—in the usual sense of the word. The six-cylinder engine has its 4½ by 4½ cylinders cast in pairs, and the crankshaft is built in three pieces bolted together, a method of construction necessitated by the use of ball-bearings. These bearings are of very big dimensions, ⅞-inch balls being used. Dual ignition is fitted, and the wires are in the form of a built-up cable with separate short leads to the plugs. The engine control is effected by a foot throttle pedal, sliding sideways. The movement is quite free, and as no pressure is required to keep the pedal in any particular position, great steadiness of running can be secured on the roughest of roads. The other foot pedal operates the clutch, and then, after a short neutral travel, the shaft brake. From the disk clutch the power is transmitted through a double universal joint to the rear axle casing. Here, before the bevel pinion is reached, a short layshaft is provided, which, in very compact form, provides a low gear and a reverse. It is claimed that this low gear is never required, except for starting on the steepest of hills. The absence of the gearbox certainly improves the chassis, which presents a strikingly simplified appearance to the eye.



FOUR-CYLINDER 15-18-HORSEPOWER SWIFT

Exhibits of American Cars

The American firms that have established agencies over here are well represented at the show. In many cases the standard models have been slightly departed from to fall in more fully with British ideas, and agents are confident that the coming season holds out good business prospects for them. The White stand is always a center of attraction, for these cars are well known to British motorists and have quite a notable list of patrons. Rollin White was busy all day explaining the special points of interest of the new models, both the 15 and the 40-horsepower types being shown.

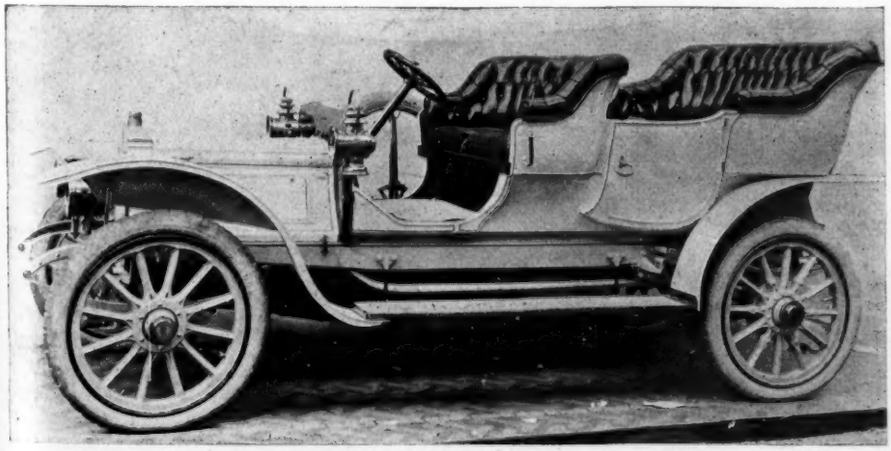
Another American exhibit to which much attention is being paid is that of the Cadillac cars. The name Cadillac always has been associated with the well-known single-cylinder vehicle which has behind it such an unvarying list of successes in reliability competitions, ending up with the famous standardization tests of this spring. Hence unusual interest is shown in the new 26-30-horsepower four-cylinder model which has just arrived.

Buick Cars Are Shown

The Buick cars are staged on stand 32, and the differences in their construction from standard British practice causes them to be carefully examined by visitors. The new 15-20 model with four 3¾-inch bore cylinders has the valves overhead, operated by tappet rods. Dual ignition—dry battery and high-tension magnetos—is fitted and the pump lubrication seems ample. The only point of the car which has received adverse criticism is the body, which is not in accordance with British standards. The agents announce that this is to be altered in future deliveries and doubtless a considerable section of the buying public will then be reached, particularly in view of the very reasonable price of the car.

The popular Ford cars are shown both in the 15-18 four-cylinder type, which is practically unaltered from last year, and in the new and distinct 20-24-horsepower. Like the British Deasy mentioned before, the cylinders of the new Ford are cast in one block integral with the top half of the crankcase.

Many American firms—Rushmore, Goodrich, Stewart & Clark, Jones and others—are to be found in the accessory section.



CAR OF ENGLISH DESIGN, THE 15-HORSEPOWER TALBOT

CAN SELL POPE PLANTS

Reorganization Committe Is Authorized To Dispose of the Property For $1,500,000

Hartford, Conn., Nov. 20—The reorganization of the Pope Mfg. Co., which went into a receivership a little more than a year ago, is now practically accomplished, much to the satisfaction of all interested parties. Vice-Chancellor Howell, of Newark, yesterday filed an opinion authorizing the sale of the Pope plants and various other assets to a reorganization committee for $1,500,000. The opinion of the vice-chancellor was somewhat lengthy and covered the situation thoroughly. But one objection was raised from the start and that was by the holder of 100 shares of the actual par value of $10,000, and he held out to the very end and contended with his counsel that the offer was "grossly inadequate."

Charles E. Gross, Hartford, counsel for Albert L. Pope and George A. Yule, receiver, appeared before Judge Shumway of the superior court asking for an order of sale of the Pope assets to the reorganization committee for $1,500,000. Judge Shumway passed the order in conformity with that issued by Vice-Chancellor Howell the day before, thereby endorsing the action of the Jersey official.

Vice-Chancellor Howell has also authorized the sale of the Pope company's Hagerstown plant, from which the mechanical equipment has been removed, for $57,000, and of the Elyria, O., bicycle factory which is owned by the Federal Mfg. Co., whose stock is the property of the Pope concern, for $35,000.

A. L. Pope, one of the receivers, expresses satisfaction over the outcome and states that the New York counsel, Joline, Larkin & Rathbone, were arranging for applications for the sale of the assets to be made in two federal courts, one before Judge Lowell, of Boston, and the other before Judge Morris, of Baltimore.

Henry V. Poor, of New York, is secretary of the reorganization committee, and the members of that body are Harry Bonner, Frederick H. Ecker and Augustus Hechscher. The plan of reorganization provides for the issue of $800,000 in 6 per cent notes, secured by a first mortgage, $2,500,000 of 6 per cent cumulative preferred stock and $4,000,000 of common stock. The receivers will at once pay the final and fourth dividend of 25 per cent, which will clear up the company's indebtedness. Since the receivership the company has made good progress and the outlook for the future is regarded as very bright. The remaining plants owned and operated by the company will henceforth be conducted on a different basis.

FIRST LOT OF E-M-F's OUT

Detroit, Mich., Nov. 22—On Thursday the Everett-Metzger-Flanders Co. shipped out its first bunch of cars—ten in number—which went to as many cities where they will be used for purposes of demonstration. From now on the firm will be getting through cars with regularity. For a while they will come at the rate of ten a day but inside of 2 weeks the rate will be greatly increased, the company being about ready to employ the additional factory space made available by the duplication of the old Wayne factory which housed its initial efforts. The record made by this firm is probably without an equal in the history of the trade. A total of 3,742 retail orders were booked before the company had a single demonstrating car out, it is asserted. This figure is, of course, exclusive of the wholesale orders which will form the bulk of the business direct from the factory. The firm has finished the installation of a local salesroom at the front of its factory in which respect its equipment is quite similar to that of its neighbor, the Cadillac, which has recently occupied its new garage.

CHALMERS-DETROIT DOUBLE CENTURY CAR AND ESCORT

STEARNS STAR ON HILL

W. W. Lanahan's Car Wins Three Firsts in First Climb of Automobile Club of Maryland

Baltimore, Md., Nov. 21—Maryland's first motor car hill climb, which was held this afternoon on the Belvidere avenue hill, between Falls road and Roland avenue, Mount Washington, proved a great success, particularly for W. W. Lanahan and his 60-horsepower Stearns. Out of the six events of the day, which were held under the auspices of the Automobile Club of Maryland, Lanahan's car won three. Lanahan was the driver in one of these climbs, that for cars driven by amateur drivers, $3,001 and over. His only opponent in this event was J. G. Nassauer, who also drove a 60-horsepower Stearns. Lanahan's time was :46. The third car which was to have been in this contest, S. A. Nattans' 60-horsepower Stearns, was out of the city.

Lanahan's car also made the best time of the day, :43½. This was in the free-for-all, the last event on the card. Wilfred Smith drove in this class and his time was at an average of less than a mile a minute, for the distance of the climb was 6/10 mile. Another interesting feature of this event was the time made by the little 10-horsepower Stanley, driven by Howard Gill, of the Motor Car Co., which covered the distance in :50¾. This car only made fifth place out of the seven contestants, for the reason that two other Stearns cars in addition to that of Mr. Lanahan, driven by Wilson Rutherford and J. G. Nassauer, finished in :45 and :48, respectively, while the 40-horsepower Chalmers-Detroit, entered by the Zell Motor Car Co., and driven by Wallace C. Hood, made the distance in :50.

The third event won by Lanahan was that for cars selling for $4,001 and over. This was by far the most exciting of the day and the one in which the best time was made by all the contestants, with one exception. Four Stearns cars of 60 horsepower each and a 45-horsepower Winton figured in this climb. The four Stearns cars finished within 6½ seconds of one another, while the Winton made the distance in 1:18. The time for the winner was :45½. Smith drove Lanahan's car in this event.

Two Chalmers-Detroits entered by the local representative, the Zell Motor Car Co., one a 24-horsepower machine and the other a 40-horsepower car, made the next best showing, carrying off the first two races, the other event, that for amateur drivers for cars of $3,000 and under, was won by the 15-horsepower Ford, entered by the Ford Auto Co. and which was driven by Osborne I. Yellott, counsel for the Automobile Club of Maryland.

In the first event, that for cars selling for $1,251 to $2,000, was captured by the

24-horsepower Chalmers-Detroit car under protest. The 30-horsepower Stoddard-Dayton, entered by Leo H. Shaab and driven by J. L. Cassard, Jr., came in first in 1:01½, but was protested by Harry A. Tate, driver of the Chalmers-Detroit car which finished second in 1:03½. Tate claimed that the Stoddard-Dayton had a magneto on it which was not included in the list price and consequently was out of the class in which it competed. The judges upheld the protest.

Nine events were originally scheduled but three of these failed to fill. In the first two classes, A and B, and the fifth, E, there was only one entry in each and these were withdrawn. In the third event a White steamer, driven by H. E. Mayer, and in the fourth race, a Ford, ran against time and made the distance in 1:23½ and 1:04, respectively.

While the hill was one of the steepest of the numerous steep hills in and around Baltimore, and includes several curves, the cars made excellent time and those in charge of the affair are pleased with the outcome. The court was in excellent condition and was kept clear by the automobile club. Summaries:

CLASS C—CARS SELLING FOR $1,251 TO $2,000

Car	H. P.	Driver	Time
Chalmers-Detroit	30	Tate	1:03½
Kisselkar	36	Heaver	1:05½
White steamer	20	Tremblay	1:09
Mitchell	30	Shuler	1:20
*Stoddard-Dayton	30	Cassard	1:01½

*Disqualified.

CLASS D—FOR CARS $2,001 TO $3,000

Chalmers-Detroit	40	Hood	:54½
Stevens-Duryea	24	Sperry	:55
Kisselkar	54	Wilhide	1:04
Winton	48	Duck	1:09½
Locomobile	20	Palmer	1:36

CLASS F—CARS $4,001 AND OVER

Stearns	60	Smith	:45½
Stearns	60	Rutherford	:46¼
Stearns	60	Shaab	:49½
Stearns	60	Nassauer	:52
Winton	45	Basilicato	1:18

CLASS G—CARS DRIVEN BY AMATEUR DRIVERS, $3,000 AND UNDER

Ford	15	Yellott	1:05
Winton	48	Heyser	1:10½

CLASS H—CARS DRIVEN BY AMATEURS, $3,001 AND OVER

Stearns	60	Lanahan	:46
Stearns	60	Nassauer	:51½

CLASS K—FREE-FOR-ALL

Stearns	60	Smith	:43½
Stearns	60	Rutherford	:45
Stearns	60	Nassauer	:48
Chalmers-Detroit	40	Hood	:50
Stanley	10	Gill	:50⅘
Mitchell	30	Shuler	1:23½
White steamer	30	Tremblay	1:34

FORD COMPANY PROSPERITY

Detroit, Mich., Nov. 22—When the Ford Motor Co. a few days ago filed its regular statement with the Wayne county authorities the reporters who usually scan such documents in a cursory way were astounded by the fact that the firm had on that date over $900,000 in cash on deposit in local banks. This unusual sum in the form of undivided profits provoked inquiry which developed the fact that the construction of the enormous factory which the company is building out in Highland park is the occasion of the enormous cash reserve. The Ford company recently increased its capital stock from $100,000 to $2,000,000 merely by transferring its surplus in that way.

PLUM GOES TO ANGERS

Automobile Club of France Officially Selects Chateauland Course for Grand Prix

Paris, Nov. 14—Angers, in Chateauland, has been officially selected as the scene of the 1909 grand prix and voiturette race to be held the end of June or early in July. The decision was taken this week by the racing board, and immediately confirmed by the full committee of the club. In return for holding the race in their district, the local authorities are under an obligation to raise a subvention of $20,000, and to assist in much of the detail work of preparing for the big event. Already the Angers committee has shown a considerable amount of activity, and when it put forth its candidature presented plans of a suitable plot for grandstands and ravitaillement posts, together with options on the rental; a complete plan for the barricading of the road, with contracts for the work by local firms; options for various plots of land around the course, a guarantee that drinking water would be supplied, and prices for transporting it; also a written statement from the roads department that the entire course would be put into condition for racing early in the new year.

The racing board has become wise as the result of years of experience in organizing races, and this year has withheld its decision until terms had been arranged for the rental of every plot of land, and for every piece of work that will have to be accomplished. As there are a dozen districts desirous of obtaining the race, competition makes it impossible for overcharging to be indulged in. It is declared that the club has also on foot a big scheme by which all the hotel proprietors will agree to a fixed tariff for food and lodging during the period of the races in Chateauland next summer.

It is roughly a triangular course, 46.18 miles round, that has been selected on the banks of the Loire, to the west of Tours and Saumur. As, in all probability, ten rounds will have to be made, the total distance will be 461.8 miles. The voiturettes probably will be required to cover six rounds, or a total distance of 277.08 miles. Although one side of the triangular course is rather narrow and winding, fast time can be made, and even with the 130 millimeters limit an average of 70 miles an hour is anticipated.

CHALMERS' BIG STUNT ENDED

Detroit, Mich., Nov. 22—The Chalmers-Detroit Co. has just finished the completion of a unique motoring stunt, in the final trip of the firm's 30-horsepower touring car on the daily double-century to Pontiac and return. The car had started on its trip August 9, 100 days before, and went over the Detroit-Pontiac course every day eight times without any difficulties other than those unavoidable ones which happen in the history of any motor journey. The course measures a bit more than 25 miles and the car on its total trip registered a total of 20,800 miles. As the car had been driven in the neighborhood of 6,000 miles before the test was started, the factory force figures that it received about six times the amount of wear which it would have sustained had it been in use for a year by the average owner. The car made its final trip in good shape on Tuesday and brought in Mayor Johnson, of Pontiac. The party was met at the Log Cabin inn by a large number of enthusiasts who had gone out from the city and lunch was served there to a distinguished gathering, including Mayor Thompson, of Detroit, and President Hugh Chalmers, of the local company. The entire party then paraded down Woodward avenue to the Hotel Pontchartrain, where Mayor Thompson, on behalf of the hotel, presented President Chalmers, of the Chalmers-Detroit Co., with a handsome cup.

MAYOR THOMPSON PRESENTING CUP TO CHALMERS-DETROIT CO.

The Readers' Clearing House

HIS IDEAL OF STEAM CAR

RENO, Nev.—Editor Motor Age—Some time ago I happened to use the columns of Motor Age for a discussion on a part of the makeup of the steam car. Since then I have received many letters in regard to countless details of the several steam cars, by far the greater number asking for my ideal of the future steam car. It being out of the question to answer them, I only request that the following b egiven in Motor Age's widely read columns as the way I would describe the line of advancement of the future of the steam car, with a few comments on current practice. I attempt no argument or criticism of present practice, as the every day performance of our premier steam car speaks amply for itself. The word ideal, as taken by the usual number of people and readers of Motor Age, seems to be a very decided misnomer to me, as their type of ideal car seems to be the chief points of good construction of the latest models of both foreign and domestic cars, all combined in one chassis. I fully concur in this, although the word ideal would not be applied in any sense of the word. No one can ever reach the ideal type, no matter how fast or far the advancement in construction. The ideal 6 or 7 years ago was far below the point attained in the 1909 models, and yet the ideal car is still sought and will be until the end of time.

Future Betterment of Type

In the following I will attempt rather to deal with the future betterment of a particular type of motive power for more efficiency in the future, not attempting to compare merits between the different motive powers in any manner at all; rather devoting my time to a line of construction I finished a few months ago, allowing such readers as show a preference for my favorite motive power to read my views on the future line of development of the steam car. As regards the rest of the chassis design outside of the generator and motor design, no mistake could be made in accepting the best in other constructions which are standard. Running gears, transmissions, etc., are something common to all types of power cars and the precedents in this line are too good to be passed over. There has been no attempt to incorporate new or untried inventions or radical departures from the high standards of efficiency in the different parts incorporated, but strict adherence to standard practice is followed. Absolute simplicity where possible in obtaining a certain point is used, but I have also followed the opinion of Professor Goss, of Perdue university, which is: "The simplest machine is not always the one which has the fewest parts," and it is a good rule to follow. I have striven for the ideal (?) car by hard work and study, and while not altogether ideal in result, I feel I have no desire to envy other cars. While my car is not the final type, I am confident my line of research is the future one for further refinement up to its limitations. I have not hesitated to purchase freely of the different parts of the several cars that particularly appealed to me. The engine alone is of my own design in detail only, the generator and controlling systems a combination of the two leading steam cars, the White and Serpollet.

EDITOR'S NOTE—In this department Motor Age answers free of charge questions regarding motor problems and invites a discussion of pertinent subjects. Correspondence is solicited from subscribers and others.

Power Keeps Increasing

It has been a very noticeable fact that since 1901, when the White company put out its first cars, that the power rating has increased with each model up to the 1909 product, and this with the fact fully evident that the power rating raise is all out of proportion to the fuel consumption. Few realize this fact, but it is true, and bespeaks the wonderful amount of study and research expended on the increasing of the efficiency of the present day motor and generator, and this wonderful advance in this particular line of power plant, after it was conceded that a finality of design had been reached in the highest type of triple expansion reciprocating engines in land or marine service.

In 1907 Professor Benjamin stated when commenting on the wonderful efficiency of the White power plant: "When the fact is considered that ordinary simple engines use from 25 to 35 pounds of water per indicated horsepower per hour and that 12 pounds is considered a good performance for triple expansion condensing engines, the remarkable nature of this performance is better understood." He referred to the fact that in the test the engine developed a horsepower on the brake at its highest load during the various tests with a consumption of 11.96 pounds of feed water per hour. And the further development of this particular car is not at an end. The general design of my "ideal" is as follows: I use a vertical, two-cylinder fore and aft type of cross compound and a flash generator, using California distillate for fuel, with both mounted under the hood. Final drive is by propeller shaft to the rear axle. The car under discussion is patterned somewhat after the American Traveller in the use of an underslung body and 40-inch wheels. The engine has cylinders 3¼ by 4½ inches high pressure and 6 by 4½ inches low pressure, double ported admission and exhaust, balanced slide valves to both cylinders and the receiver and high pressure cylinders being steam jacketed. The steam jackets are not an auxiliary steam passage, but constitute part of the main steam pipe from the generator to the throttle, throttling being done after steam leaves the jacket for the high pressure steam chest. This plan insures the highest temperature in the jackets regardless of throttle manipulations, the jackets adding slight weight but absolutely no added complication to the machine. Without attempting to enter into an argument of the failings and efficiency of the compound, I will only pass on a few points and those conversant with the handling of the compound system, especially under a shortened cutoff, etc., will readily see the points I have in view. Besides the usual number of points usually brought forward to prove the economy of the compound engine, one appears for it in the motor power plant not usually brought forward in the larger plants. Those in charge of larger engines know the disturbance to steam distribution in a 5-inch valve travel of a very small error in valve setting and also the lost motion.

Errors Might Be Minimized

How much more would it be apparent in an engine having 1 inch and then run over the valves for a running cutoff at less than half stroke? The errors found at the shorter cutoffs would be greatly minimized at the longer cutoffs used most advantageously with the compound motor. Another point brought out is the undisputable facts to those who realize and know the proper sphere and application of the system of compounding. The 1908 White car uses a gear on high speed gear of a ratio of two to one. Lower this gear ratio to five to one and in ordinary town or boulevard street work the fuel and water consumption would be appalling. The compound system will show the greatest efficiency at the higher gearing not equaled by the single expansion engine, but must be used with a two-speed gear for excessively abnormal leverage in case of unusual road conditions. The economy of keeping the motor speeds down to the proper speed even at the highest car speeds needs no other reference than to the fact that the general trend of standard practice in the internal combustion vehicle of using the four-speed gear set, direct drive on third and the fourth to be used at high speeds to keep the motor speed down to the most efficient revolution per minute. The steam motor is capable of still higher gear ratios on the usual driving speed than the gas motor and especially the compound steam motor on account of the abnormal tractive power obtained in starting by simpling.

It is a noteworthy fact that the practical limits of driving wheel diameter with the single expansion locomotive of the high speed Atlantic type do not exceed 84 inches, while 87 inches are more easily handled with the system of compounding due to the enormous extra effort possible in starting the heavy trains by simpling. I know that reference to the compound locomotives will be met by the usual reply, in reference to the apparant failure of the American railroads to heartily endorse it as standard motive power, but its apparent failure resulted from other causes than economy in fuel and water. Several hundreds of heavy compound locomotives have been rebuilt to the single expansion type in the last few years by the leading railroads of the United States, but the apparent failure must be taken with a grain of salt, in view of the fact that the return to railroad work of the system of compounding as exemplified by the Mallet articulated compounds built for the B. & O., the Erie and other roads. And this notwithstanding the fact that experts have stated the total inability of the compound system to be efficient under varying loads and conditions of service of the engine.

Adaptability of Compound

It proves conclusively the adaptability of compounding to get the greatest work from the boiler limitations of the locomotive. This is no more aptly brought out than by the application of compounding to the steam motor coach built by the largest firm of locomotive builder in the world, the American Locomotive Co. These are operated identically under the same conditions as confront the motor car. Railroad standards, while they are good examples to follow in practice, do not prove the fitness of everything. The absence of any degree of superheat in the motor car steam power plant would have relegated it as a propelling agent to the junk pile long ago, yet the readiness of the American railroad companies to adopt the superheaters with few exceptions reminds one of the eagerness of a man to pick up a pet rattlesnake, especially in its blind period. I know the American Locomotive Co. builds a gas car, and a good one, too, but I daresay if the White patents were licensed as is the Selden patent—well, competition is the life of trade and I think the White would have a good race for its money. There is too good a market for a good steam car to those who have a leaning towards steam as a motive power as I have, and I think their name is legion, too.

In regard to the practical designing of the compound motor of the type applicable to the motor car two errors creep in which have been greatly magnified, especially by the type of arrangement of the lesser parts of the motor. I refer to the high compression existing in the high pressure cylinder at shortened cutoff or valve travel, and also the excessive cylinder clearances inherent with the proper passage of the steam through the low pressure cylinder. It is a well known fact that with the usual standard valve gear for a motive plant of this character, the Stephenson link, that the cylinder clearance in the high pressure cylinder sometimes amount to 8 per cent, such amount being necessary to handle the high compression. This entails a larger valve with its resultant friction as also does the low pressure large port areas. The Stephenson link never showed up its failings so badly as in the compound system, especially at shortened cutoffs, but to my line of reasoning the radical type of valve gear offers greater inducement in this type of motor. Clearances and compressions are points easily handled with the Corliss type of gear, but it is totally inapplicable to a motor having the revolution per minute found in the motor car power plant, for reasons too well known to be commented on. With the fixed limit of steam pressure and superheat found in the White system, it is up to the designer to adopt some type of positive acting gear nearest the Corliss movement, and I think that either the Joy or Walshaert gear fulfill these conditions as well as any non-complicated gear. Their rapid rate and sharp admission and exhaust, longer cutoff, later exhaust, later and consequently less compression and an accelerated exhaust period at shortened cutoff are the most prominent features, and are a pronounced remedy to the two greatest evils in compounding. And in the addition of double ported admission and exhaust valves the above points are more pronounced when set as double ported valves are set. At least that is my belief.

Features of Walsheart Gear

I use the Walsheart type of gear, designed by one of the best valve motion experts hired by the locomotive builders, and have no reason to regret its application. The Joy gear seems to have a better reputation than the Walsheart on the continent, but the attention drawn to the latter gear in this country has resulted in an absolute correction of its few faults, and it is now on a par with any type of radical gear used. The double ported admission and exhaust valve has been used in marine service for years with the greatest economy resulting, especially in the higher speed engines. The plain D slide has evidently filled the requirements as a good steam distributer in the small engines with a moderate speed, but for high speed work and the problem of correctly getting the greatest number of heat units and greatest pressure through a given port recourse must be had to some form of double-ported valves. They also allow of a better valve setting all around. Considerable trouble has been experienced in designing the port areas of low pressure cylinders without a clearance all out of proportion, and the double-ported valve was the result. The valves are balanced to reduce friction under high pressure and high superheat. The engine and two-speed gearset are combined in one unit.

Steam is supplied by a 30-horsepower White generator, minus the usual automatic devices, the controlling element being the donkey pump used on the Serpollet steam car. To those not conversant with the Serpollet system, I will state that an auxiliary steam pipe from the throttle valve leads to this small donkey pump, fastened on the left outside side of chassis over the running board. This pump actuates two pumps, one the water pump and the other the fuel pump, their respective capacities being ten quantities of water to one of fuel. This ratio in my design raised the heat of the steam up to 900 and 1,100 degrees Fahrenheit, which was entirely too much, necessitating a change of fuel and water ratios to bring the degree of superheat to practical limits of a slide valve. This donkey pump receives steam first before the engine, and its speed depends on throttle manipulations, regardless of engine speeds. A small sub-throttle is interposed in this donkey pump supply pipe for occasional change for the road conditions. One degree of opening suffices for all town and ordinary road work with very little change, and another for hill and fast work. I fail to see the impracticability of still further increasing the limit of superheating by fitting some type of good poppet valve gear to the high pressure cylinder and a balanced slide to the low, and it undoubtedly will be done at some stage of the game. I use a gasoline pilot light and a distillate burner. I see by the 1909 announcements that the White also has adopted the distillate burner. I have no cause to regret it in my plans.

His Car Only a Starter

My entire car is simply a starter in a particular line of development, but with several years' experience with different types of steam cars I have every reason to be pleased with the result. My fuel and water mileage I would not dare to publish, for they appear too unreasonable for publication. I do not make 9 or 10 miles to the gallon of fuel, but it lacks very little of it, I think. For the power output, no hydro-carbon motor can excel it, I believe.

I think I have fully covered my line of suggestion and thoughts on this question, but in conclusion I only wish to add that the march of progress has not left the old reliable steamer in the rear, in my opinion.—W. R. Harlan.

PROLONGING THE LIFE OF A MOTOR CAR TIRE

By Hiram Percy Maxim

WHAT is the matter with our tires? This question is probably asked by the motoring public more times a day than all other motoring questions put together. That there is very much the matter with the tire is undoubtedly the case, and it is the writer's object to point out what is probably the greatest trouble.

The primitive tire is the metal band around a wheel which forms a tread. The modern pneumatic tire is a band of compressed air around a wheel which forms the yielding tread we require for a motor car. The metal tire is able to hold its shape and its position on its wheel by virtue of its natural strength. The air tire is not only unable to hold itself together, but it is striving with all its might to dissipate itself. It requires some form of a retainer or envelope for holding it—and just here, in more senses than

FIG. 1

one, lies the rub. The container or envelope which many years of experience has taught is the best compromise, is a combination of rubber and cloth fabric. The former furnishes the air tightness, while the latter furnishes the mechanical strength to withstand the strains. For convenience in repairing accidental air leakages a removable inner tube is used, which leaves the strain and wear resisting to the outer portion of the structure, which then becomes merely an outer casing or shoe, as it is termed.

Blowouts Chief Cause of Trouble

Now, it so happened in the course of the development of the motor car that as vehicles became rapidly larger and heavier and speeds higher and higher, this outer casing became thicker and stiffer until a very resistive structure resulted. Where the ordinary tack or nail would once always puncture, with the thick

WATCH THE INDICATOR GAUGE

casings they were not long enough or strong enough. Today it requires quite a robust nail to get through and puncture an inner tube. Some of us came to believe that tire troubles were beginning to be conquered, especially for the first few hundred miles after new casings were put on. This belief has always been short-lived, however, for a worse difficulty was confronted in the form of ruptures or bursting of the outer casings, or blow out, to use the popular term. This trouble is now the most pronounced form of tire trouble, some motorists believing it to be 90 per cent of all tire trouble.

The failure of a casing is, of course, a very serious form of trouble, as a car cannot go on until a new casing is substituted for the one which ruptured, even though we overlook the very important

FIG. 2

expense involved. Under such circumstances the tire is, of course, blamed, and usually another make is tried next time. After trying every make and finding no material difference, the motorist, in exasperation, demands an explanation by asking the question with which this article opened—"What is the matter with our tires?" This question has not been satisfactorily answered publicly, and it, therefore, is a matter of considerable interest. In the accompanying illustrations the tire itself will be found to give its own answer.

Illustrating Pneumatic Tires

Fig. 1 shows a 4-inch tire in its natural form as it would appear if cut open. The fabric which is incorporated in the rubber is shown distinctly. The inner tube is shown inside. Let us now see the

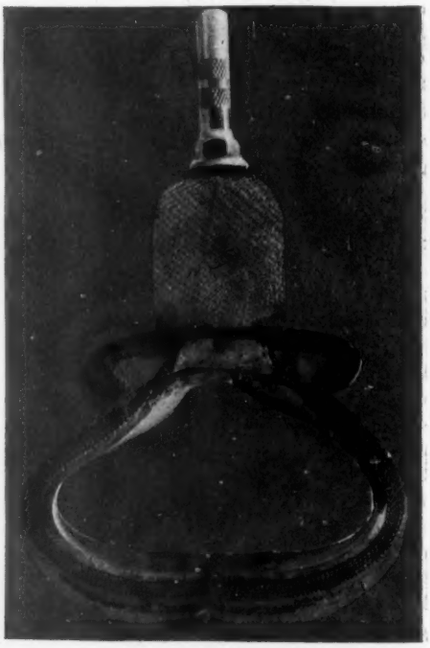


FIG. 3

effect upon this structure of deformation, for deformation and reformation, back and forth, is the daily life of a tire.

Fig. 2 shows a moderate deformation, such as would occur when a properly inflated tire runs over an obstruction approximately 1 inch high, something that occurs a great many times a minute during the running of a car. It will be seen in the illustration that the walls of the casing are slightly bent. When we bend such a relatively thick wall we require that the material in the wall work or stretch or flex very considerably. The more we bend the wall the worse this working or flexing.

Now look at Fig. 3. This shows what occurs when an improperly inflated tire runs over an obstruction approximately 1 inch high. Observe the bad bend in the fabric and imagine the result of re-

peatedly bending this material back and forth this amount, thousands and thousands of times. This is what happens when an improperly inflated tire is in motion. Obviously it must break the wall structure at the sharpest point of the bend sooner or later. It will be sooner if the bend is sharper, due to the tire being softer, and later if the bend is gentle, due to the tire being harder.

Improper Inflation of Tires

At this point let us examine ourselves and ask how we inflate our tires. Most of us must answer that we pump the tire until it looks fairly round where it bears upon the ground. Then we usually kick it, apparently on account of some extra accurate gauging ability of the toes of our boots. Look at Fig. 4. This is a

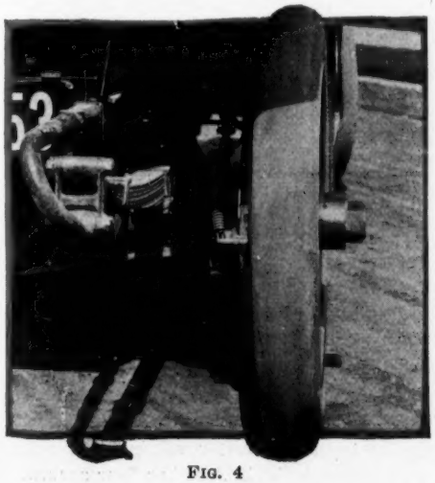


FIG. 4

photograph of a 4-inch tire on the rear wheel of a car, and which has been pumped by gauge to exactly 30 pounds pressure. It looks fairly round. In a

FIG. 7

hurry or on a hot day it is very easy to feel sure it is pumped up enough.

Now look at Fig. 5. This shows the same tire pumped up to 50 pounds pressure. It must be confessed there is difficulty in telling the two figures apart. But this is not the worst. Examine Fig. 6. This is the same tire pumped up to 90 pounds pressure and photographed from the point which most tires are viewed from when judging their inflation. Ninety pounds is the pressure the tire should have, and is the one advised by the tire manufacturers.

Although it is three times higher pressure than that in Fig. 4, and nearly twice as high as that shown in Fig. 5, it would take a careful measurement to determine it. No amount of "looking" or kicking would give even a fair approximation of which was which.

FIG. 5

We inflate our tire by guessing at the degree of inflation, or attempting to judge it by the appearance of the tire, whereas the photographs clearly show that there is but little difference in outside appearance between a tire pumped up to 30 pounds pressure and one pumped up to 90 pounds. There is hardly a bit of difference between the appearance of 50 pounds and 90 pounds. Yet 50 pounds corresponds to the sharp bend shown in Fig. 3, and 90 pounds corresponds to the gentle bend shown in Fig. 2.

Experiments with Obstructions

There is one more experiment we should make. This is to catch a tire actually passing over the 1-inch high obstruction, so we may study deliberately just how things are. Look at Fig. 7. This shows our 30 pounds inflation, which is the favorite of our wives and daughters on account of its soft riding qualities, passing over the obstruction. Notice the terrible punishment the thick and stiff wall of fabric must be receiving. The bend shown in Fig. 3 is not nearly as bad.

Now turn to Fig. 8. This shows our 50 pounds inflation passing over. This pressure is the average existing in the great majority of tires the country over. While its deformation is not as bad as the 30 pounds pressure of Fig. 7, yet we can easily see that it is enough to rapidly

FIG. 8

bring about a fabric rupture, when we realize that the passing over 1-inch high irregularities is practically a continuous performance in the running of a car.

Now, finally, let us see what the deformation would be if we kept our tires pumped up to where the tire maker tells us we should keep them. Look at Fig. 9. This shows the properly inflated tire taking a 1-inch high obstruction. The bending and punishment of the casing is entirely different, and a casing would be able to stand it longer, probably, than the rubber tread would stand the wear it is subjected to. In other words, although a properly and an improperly inflated tire has very nearly the same appearance when standing upon a flat surface, it suffers an altogether different degree of punishment when passing over irregularities on the highway.

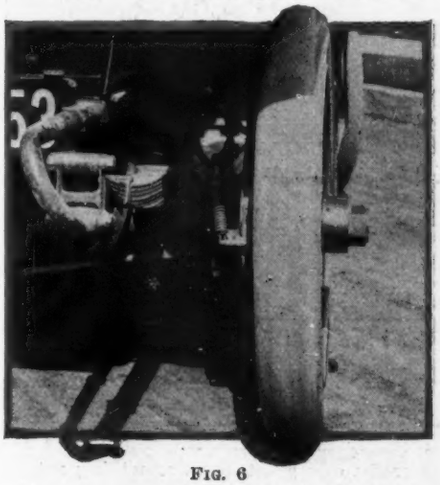


FIG. 6

This really tells the story. The only thing remaining is to tell how a tire

FIG. 9

should be inflated to be sure that it is done properly.

Proper Inflation of Tire

The only way to properly inflate a pneumatic tire is to use a tire pressure gauge to measure just what pressure is actually in the tire.

And, now, in conclusion: With the tires of a car always hard it goes without saying that they will last longer, and unless the writer is very much more in error than he thinks he is, he can answer the question with which this article opened. This answer is: "We do not keep them properly inflated."

THE ATWATER KENT IGNITION SYSTEM

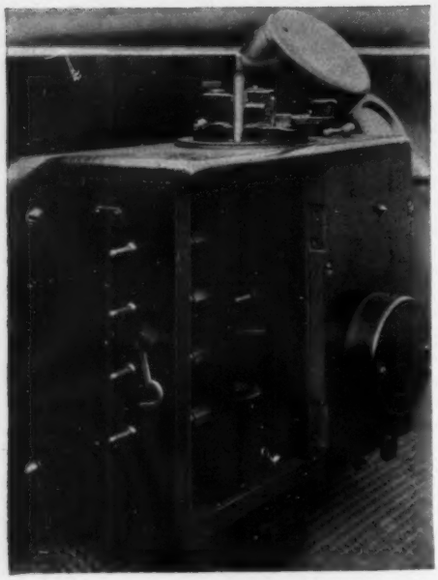


FIG. 1—ATWATER KENT DEVICE

THE unique feature of the Atwater Kent spark generator, which distinguishes it from all other ignition apparatus, is its signal economy of current. The makers claim that ordinary 6-inch dry cells last 1,500 to 2,000 miles with the ordinary four-cylinder engines, and numerous users report even greater mileage, sometimes double that claimed. The reason for this economy is very simple. The device referred to does not make something out of nothing; neither does it economize current at the expense of spark heat, for the sparks it gives are fully equal to those of the average trembler coil. It simply does not waste current, that is all. To understand this it is necessary to refer to the construction and operation of the ordinary timer. It takes a typical spark coil roughly 1-200 of a second to "build up" after the circuit is closed. To set the trembler in motion is likely to require a little longer. A small engine at maximum speed may run 1,500 to 1,800 revolutions per minute, or twenty-five to thirty turns per second. To make sure of holding contact long enough to enable the coil to build up under the most unfavorable conditions, the average timer closes contact for about 40 degrees of its circumference, or 80 degrees of the crank's rotation. At 1,800 revolutions per minute this represents 1-135 of a second, which is no longer than is necessary to get the trembler into motion, and at that speed only one spark per contact will occur. But suppose the car is running slowly and the engine makes 600 revolutions per minute. Each contact now lasts 1-45 of a second, and if the trembler speed is 220 vibrations per second there is time to make three or four sparks, after full allowance is made for trembler lag before the first spark. When it is remembered that, at the low high-gear speeds now demanded of a flexible car, the engine is not running over 300 or 400 revolutions per minute, it is easy to see where a great deal of the battery consumption with the ordinary coil system goes. Obviously only the first spark produces any result, since the subsequent sparks take place in the midst of flame or hot but dead gases.

In the Atwater Kent spark generator a single mechanism performs the functions of a timer and trembler. There is, in fact, no trembler at all, and the timer, which is driven by gearing from the engine, produces but one practically instantaneous contact for each ignition. The duration of this contact is just long enough to enable the coil to build up for the desired length of spark, and it is the same whether the engine runs fast or slow. By turning the platinum-tipped contact screw, which is the only thing adjustable about the whole apparatus, one may vary the duration of contact within limits, and produce a longer or shorter spark at will. The coil is so large that if contact were held long enough to cause it to build up fully, the spark would be well over ½ inch long; and such a spark, it may be remarked, is produced by snapping the button for starting "on the spark."

To pass from the abstract to the concrete, it may be noted that the complete apparatus comprises the following elements: 1, the gear-driven contact maker referred to above; 2, a single jump-spark coil and condenser; 3, a high-tension distributer of unusual size and thoroughness of insulation; 4, spark advancing mechanism; 5, button for starting on the spark; and, 6, individual cut-outs for testing the cylinders. All this apparatus is contained in a single case which is mounted on the dashboard. See Fig. 1.

The principle of the contact maker is best explained by reference to illustration, Fig. 3, which shows an imaginary device for explanation only. A is a contact spring fixed at one end and contacting with an insulated screw B; C is a stationary steel block, and D is a steel wedge attached to a spring anchored at E. By a hook or the like D is drawn leftward to the position

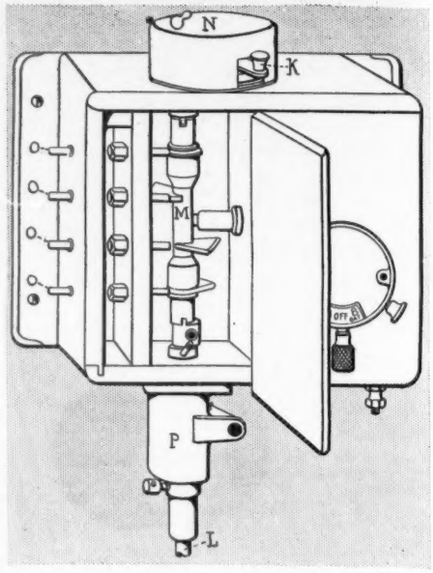


FIG. 2—SHOWING INTERIOR OF BOX

shown and then released. As it flies back under the spring tension it will press A into contact with B, and this contact will be released when D drops off from the right-hand edge of C. It is clear that duration of contact will depend only on the time taken by D in passing C.

Now let us see how this principle is embodied in the actual apparatus. A, Fig. 4, is the top of a shaft revolving to the left or counter-clockwise. It has four accurately milled notches, which engage a hardened steel snapper B—shown also in two views in Fig. 7. This snapper is drawn to the left—see Fig. 5—and then released. Flying back under the influence of spring C, it rides up over the round part of the shaft like a wedge—see Fig. 6—and in doing so pushes upward on the hook-shaped end of the flat steel piece D—see also Fig. 7. This piece D is part of the contact maker, which is pivoted at E and comprises also the flat copper spring F and the flat steel plate G—see Fig. 7—which prevents F from vibrating. The spring H holds F normally out of contact with the

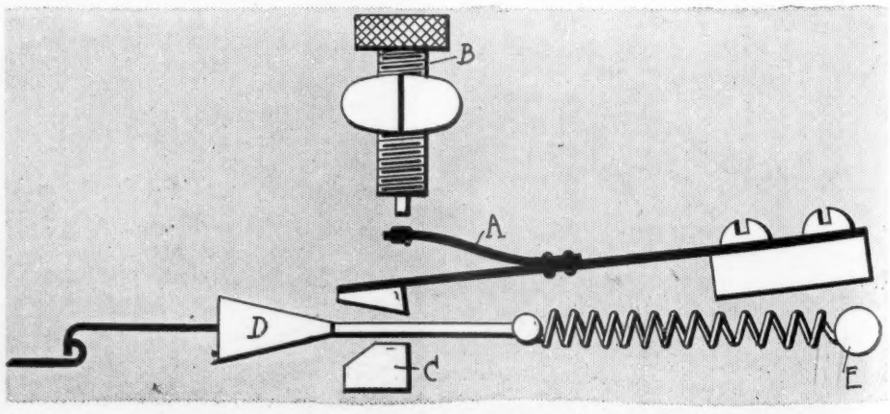


FIG. 3—DIAGRAM OF ATWATER KENT PRINCIPLE

contact screw I. From this explanation it is clear that B acts like the wedge D in Fig. 3, producing contact and releasing the contact maker with a snap as it returns to its normal position, Fig. 4, where it is arrested by a spring wire stop J. It will be seen that this mechanism gives exact synchronism of spark time. The starting-button K, Figs. 2 and 4, short-circuits the contact maker, and on its release causes a spark to jump through the distributer to whatever cylinder is in the firing position.

In Fig. 2, L is the driving shaft; M is the four-bladed distributer, insulated by fiber sections from the shaft members above and below. The contact maker is covered by the removable cap N; O, O, O, O are the cylinder cutouts, which simply ground the leads from the distributer to the spark plugs. The spark is advanced by a shaft section with spiral grooves and collar inside the housing P. The primary winding of the coil is not grounded, but both battery leads go direct to the spark generator. The only other wiring is the cables running to the plugs.

Although in a technical sense the current economy is perhaps the most interesting part of this device, to the user perhaps an even more valuable feature is its extreme reliability, which is due partly to inherent qualities and partly to extreme care in construction. The coil and distributer are so large that perfect insulation is a simple matter. It might be supposed that the contact maker would wear out, but as a matter of fact the forces involved are too small to cause wear. The steel snapper B weighs but 1-14 of an ounce, and it is glass-hard. The ratchet of the shaft A is also case hardened, and so is the steel piece D. The wear of these parts after running many thousands of miles has been found to be absolutely negligible. Regarding the platinum contact points, the makers claim that they never require filing, because, making but one contact per ignition, they never get so hot as to burn. The only adjustment

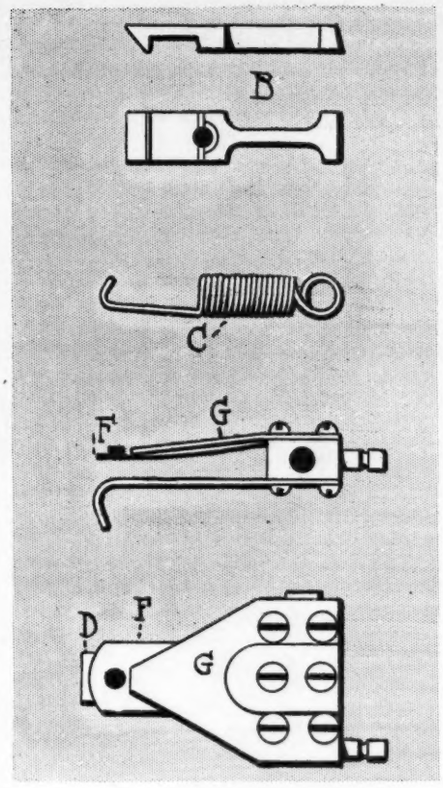


FIG. 7—ATWATER KENT

needed is a quarter turn of the contact screw once in 500 miles. When fresh batteries are installed the contact screw is adjusted to give the maximum power of the engine, which is found not to call for the maximum duration of contact. This adjustment will probably be good for a thousand miles, if the user chooses to leave it so long. It is a feature of the device that it is unnecessary to carry spare cells in reserve. When the engine is observed to miss, the contact screw is simply turned a little closer, and this enables the user to get home from any reasonable distance. When the cells get down to 2 amperes on short-circuit test they are discarded, although it is possible to run with cells testing as low as 1 ampere.

PREIGNITION CAUSES

Whatever causes preignition will also cause very rapid combustion when it does not cause actual spontaneous ignition. For example, carbon on the piston heads may not have accumulated sufficiently to cause premature explosions, but it will cause the charges in those cylinders to burn faster than in the others. The reason for this is that spontaneous ignition is governed partly by the temperature and pressure of the charge. If the flame starts from the spark plug alone, it must travel through the entire mixture progressively. If, however, it starts from two widely separated points, combustion will be completed in much less time. If the carbon deposits on the pitson head have attained a certain temperature they will not ignite the charge before the spark, but the immediate effect of the spread of flame from the spark plug is to increase both the pressure and the temperature of the unburnt gases, and this increase may be just sufficient to cause ignition by the hot carbon. The effect therefore is similar to that of two spark plugs, one igniting immediately after the other. Carbon is not the only thing that will cause preignition. Inwardly projecting edges of asbestos packing under igniter plates or removable caps may get hot enough to fire the charge. Spark plugs having long and slender stems projecting into the combustion space may act the same way, particularly in a high compression engine. Even sharp projections in the iron of the cylinder head due to careless molding will have the same effect, particularly if located in the path of the exhaust gases.

CONDENSATION IN DISTRIBUTER

An odd and possibly unusual case of misfiring in a distributer was recently traced to condensation of moisture over the inner surfaces of the hard rubber casing. The distributer was sealed approximately air-tight, with the idea of making it dust-proof, but the discovery of condensation in it prompted the drilling of two small ventilating holes, by which the misfiring was stopped.

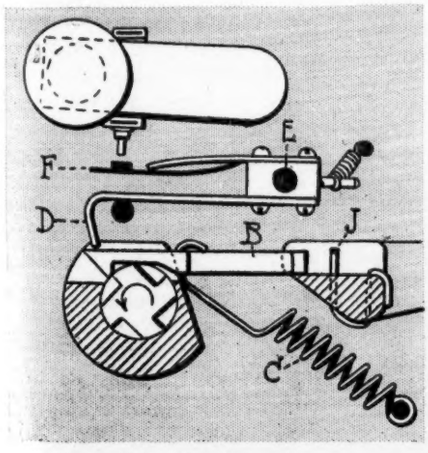


FIG. 5—ATWATER KENT

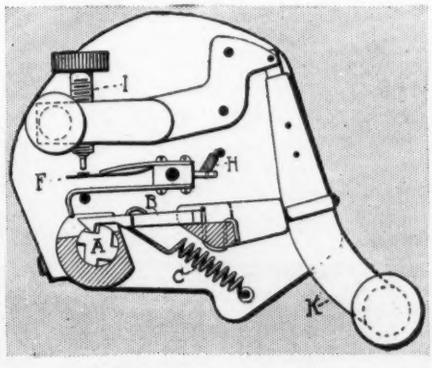


FIG. 4—ATWATER KENT

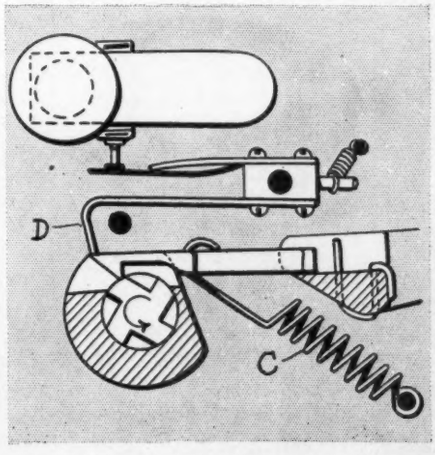
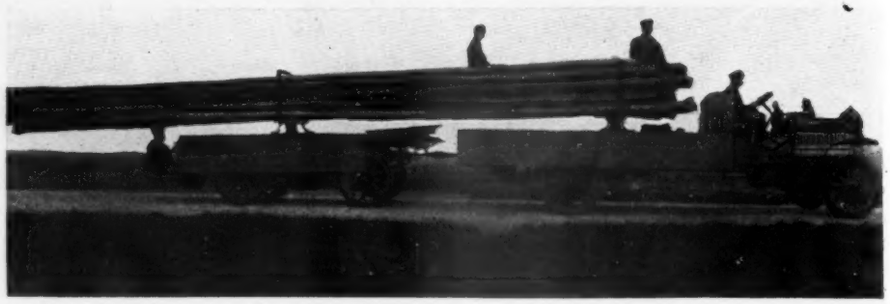


FIG. 6—ATWATER KENT

The Realm of the Commercial Car

THE modern motor car has become a serious competitor of the railroad, but in certain instances it helps to develop the former. In every civilized country there exist motor bus lines connecting railway stations and small towns and villages, while at present a new experiment is made in the German colonies to take advantage of the power wagon for building a railway. Colonies can be of financial benefit to the mother country only if there are efficient means of transportation to secure the export of the native product and the import of articles from the home country. Quite recently this has been shown by the visit to East Africa of the German colonial secretary, Mr. Dernburg, who has just completed his second tour of inspection. His visits showed that the building of railways should be pushed. At once the order was given for several heavy motor cars which are herewith illustrated and which will carry the various building materials, such as rails, beams, cross ties, stones, mortar and especially telegraph poles to the places where the railway is being built. The strongest type of chassis is used, the same which is utilized for war purposes by the German army; each is able to carry 5,000 to 6,000 kilograms net load, also to pull a trailer. A special feature is that motor car and trailer are provided with a turning device swiveling in the horizontal plane in order to transport around curves long beams, and especially telegraph poles, in the same manner as is done on special freight cars for railways. Thus poles up to 18 meters in length have been successfully transported around rather sharp curves. Each wheel has two sets of solid rubber tires, but if necessary steel tires can be fitted. The motor wagons have just been completed and are being shipped to German East Africa after having been tried at home with success.



MOTOR CAR UTILIZED IN CONSTRUCTING RAILROADS BY GERMANY

ORDER FROM VANCOUVER

About a year ago the city of Vancouver, B. C., placed a contract with the Seagrave Co., of Columbus, O., for two motor-propelled hose wagons and one motor-propelled chemical engine. These machines have been in service over 10 months and it is claimed they have given entire satisfaction to the department, the best evidence of which is the fact that the same city recently placed an order with the same company for another chemical engine and another hose wagon, the hose wagon to be fitted with a turret nozzle and have a capacity for 2,000 feet of hose. For this work the city has specified that the new engine be designed and built by the Seagrave Co., and must develop about 45 horsepower according to the A. L. A. M. formula.

MUST FINISH TRIP

An amendment has been made to the police regulations of Washington, D. C., whereby companies operating sight-seeing motor cars will be compelled to return their passengers to the point from which they started. There are fifteen of these rubberneck wagons working in the national capital and strenuous protests have been made against their action in forcing passengers to disembark at some point distant from the starting point, and before the completion of the trip.

HOOSIERS LIKE MOTOR RIGS

The average Hoosier is a venturesome fellow with considerable faith, if the manner in which he has taken hold of the commercial motor vehicle proposition is any indication. Throughout the present season the commercial vehicle has entered more new lines of business in Indianapolis than in all other years of its existence combined. During the last week the Excelsior Laundry Co. installed a gasoline delivery wagon and displaced two horse-drawn vehicles. If the wagon makes good, and there is every reason to believe it will, the company expects to displace its entire horse-drawn equipment of about twenty-four wagons. Until this season users of commercial motor vehicles have insisted upon holding a horse or two as a safeguard against breakdowns. Now they no longer see the necessity of this, as all vehicles sold in Indianapolis are under a maintenance contract to always have a car in service.

Recently the Polk Sanitary Milk Co. purchased a gasoline truck to haul milk from small towns and farm houses to Indianapolis. This enables the company to carry its milk in a more sanitary manner, as one of the first precautions in handling milk is to get it in a cool place as quickly as possible. Formerly the milk was juggled for half a day on an electric traction freight car before it reached the city.

T. F. Gibson, a retail butcher, has installed a motor delivery wagon and has dispensed with horses. So far he has found it possible to deliver meat more promptly and has also been able to cover a larger territory, thus dispensing with horses.

Probably among the most successful users of trucks have been the big plumbing, pipe and tool supply houses. This is a business that requires frequent deliveries covering practically the entire city and often the loads to be delivered are so heavy a team of horses can hardly pull them. Three houses of this kind are having continuous delivery service and irrespective of the weight of the loads, make deliveries at a speed of 15 miles or better an hour.

E. O. Langen and Rinks, two of the largest of the local cloak and women's suit houses, are now making all of their deliveries with gasoline delivery wagons. Rinks, in fact, was one of the first commercial vehicle users in the city, starting out 9 years ago with an electric delivery wagon.

SAVES TIME AND LABOR

Postmaster Craig, of Lynn, Mass., has demonstrated that the motor car is an essential part of Uncle Sam's mail service, at least in his territory. On a recent visit to Washington he complained of the loss of time occasioned by the collections made with a horse and carriage in the remote parts of his district and he was authorized to try a motor car. This proved a big success. The car requires the services of but one man and it makes three long trips every day. Previously it took two teams and two men to do the

work, so the postmaster now has the extra man for delivery work. The machine used by the department is an 18-horsepower Ford runabout.

COAST TO USE BUSES

Four motor trucks and buses will be used in establishing an extensive stage system in the Okanagan country, Washington, northwest of Spokane. Two of the cars are of 60 horsepower, while the others are 30 and 25 respectively. The larger cars carry twenty-seven passengers and 10 tons of freight. Two cars go to Kettle Falls to carry freight between Marcus and the steamer landing 3 miles below Kettle Falls, a distance of 11 miles. F. L. Barney has charge of the cars, and associated with him in the enterprise is Captain Bruce A. Griggs, who, until recently, was general manager of the Columbia and Okanogan Steamship Co. He is now running a steamer between Spokane Rapids and Kettle Falls, connecting with the motor stages at the latter point, while another steamer is on the run between Wenatchee and Brewster. They already have cars running between Brewster and Oroville, 80 miles. This is the main line, but branches will be established as additional motors are secured. Two of the cars will carry freight on this route, making the run in 8 hours. The horse stage required 2 days to cover the distance.

BUS LINE IN TROUBLE

The Auto Transit Co., of Philadelphia, which has been operating a line of electric buses on Broad and Diamond streets, on November 18 applied, through the prothonotary of the common pleas court, for the appointment of a receiver to wind up its affairs. The chief reason set forth in the petition for this action was the failure of the public to patronize the double-deckers. This was mainly due to the fact that about 2 months ago the fare was raised from 5 to 10 cents, since which time the patronage fell off fully 75 per cent. Vice-President and General Manager Hughes, when asked for the cause of the suspension, said: "We cannot operate a line of this length—5 miles—on a 5-cent basis. The public would pay no more, and as our expenditures were exceeding our receipts right along we concluded it was wise to wind up the company before we were in too deep. As it is, we shall probably pay dollar for dollar. Should the public show a disposition to patronize a line run upon a 10-cent basis there will be no difficulty in the way of a reorganization and the resumption of business." It is the consensus of opinion in the Quaker City that the line will not be reorganized very soon, if at all, as the service afforded, even under the best of conditions, was not of the best, and the Philadelphia public would never stand for a 10-cent fare—especially just now, when the Rapid Transit Co. is showing a disposition to raise its fares to a straight 5-cent basis, and do away with the six-for-a-quarter tickets. Not a few of those in a position to know intimated that the Rapid Transit Co. had secured a controlling interest in the Auto Transit Co. and had by its manipulations forced a receivership, but this was indignantly denied by officials of both companies.

APPERSONS MAKING TAXICABS

Recent visitors to the plant of Apperson Brothers Automobile Co., of Kokomo, Ind., have been surprised to learn that this concern is manufacturing taxicabs. Four of these cabs have just been shipped to the H. P. Harrison Co., the Apperson representative in Los Angeles, and upon arrival they will immediately be put into service. The bodies are mounted on the regular Apperson model O chassis. The motor is 30 horsepower four cylinders, cast separately. Other specifications include double system of ignition by magneto and storage battery, three-speed selective transmission, shaft drive to full floating type of rear axle. The wheels are dished, running on a plumb spoke, and all 34 by 4 in size. The body is of the landaulet type, upholstered in leather and broadcloth head linings. When desired the top may be pushed back, all windows concealed within the body work, and the window frames folded down. When desired the cabs may be equipped with a removable top over the driver's seat, and a standing front glass, also removable, though the top may be taken off and the front glass left in position.

ELECTRIC TAXICAB SERVICE

A company has just been formed in Cambridge, Mass., to turn out commercial vehicles that will mark an epoch in this line because of the combination of concerns now drawn together. The new company is known as the Commercial Truck Co. of New England and gas and electric concerns were drawn into it when it was formed. The plant is located in the factory of Charles Waugh, of Cambridge, and is under the supervision of Bertram D. Sumner. The company is making a speciality of a new electric taxicab and it has secured several franchises which will be in operation as soon as a number of the cabs now under way have been completed. The new taxicab is of the landaulet design, seating four inside with a provision for a fifth. One person may sit with the driver. The machine operates on five speeds by a hand wheel on the steering column and can be opened up from 9 to 22 miles an hour. There is also a foot control which will bring the speed up as high as 30 miles an hour. The battery has a 15 kilowatt hour capacity and 84 miles has been covered on one charge with five persons aboard and over country roads. An average speed of 18 miles an hour may be maintained for 55 miles. At an average speed of 11 miles the car will cover 80 miles on one charge of the battery. If necessary the battery may be exchanged in 15 minutes. The total weight of the car is 2,800 pounds.

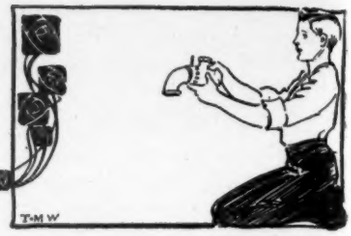
KNOX TRUCK IN SERVICE

The Knox Automobile Co. delivered its first four-cylinder water-cooled truck in New York city early last week. This vehicle, which is of 3 tons capacity, is said to have made the run from Springfield, Mass., a distance of 157 miles, altogether on the high gear, passing several touring cars on the Connecticut hills. This truck is now hauling heavy loads in the city streets.

FOR GOVERNMENT USE IN GERMAN EAST AFRICA

How to Secure a Patent

Spain and Russia



EDITOR'S NOTE—This one of a series of articles on obtaining patents by H. G. Ward, Motar Age correspondent, Washington, D. C.

UNDER the Spanish patent law any Spaniard or foreigner who intends to establish or has established in the Spanish dominions a new branch of industry shall have the exclusive right to work the same during a certain number of years, subject to certain rules and conditions. Patentable inventions consist of machines, apparatus, instruments, mechanical or chemical processes or operations which as a whole or in part are of original invention and new, or which, if not new, are not established or exploited in the same manner or under the same form in the Spanish dominions.

The Spanish law provides for three kinds of patents, as follows: First, patents of invention for subjects of original and new invention. Their duration is 20 years. Second, patents of introduction for all that is not of original invention or which, so being, is not new. The duration of this class of patents is 5 years. The third class is for "patents of importation," which applies to all original inventions, even though the inventor has already obtained a patent for the same invention abroad, if he makes application in Spain before the expiration of a period of 2 years from the time of obtaining the first foreign patent. The duration of this class of patents is 10 years. The fourth class of patents are known as "patents of addition," which expire with the principal patent to which they relate. For working a patent in Spain there must be paid an annual and progressive tax of $1.93 for the first year, $3.86 the second year, and so on, increasing by $1.93 each year, payable in advance annually. A single tax of $4.82 is provided for "patents of addition."

Rights of Inventors

The right which is conferred by the patent of invention, or, as the case may be, the right derived from the application, can be transferred entirely or partly by the various ways established by the Spanish laws relating to private property. A patent can be granted to one person or to several, or to a society, whether they be natives or foreigners. Patents are granted without previous examination as to novelty or utility, and must not therefore be considered in any case as a declaration or certificate of the novelty or utility of the object to which they refer. Qualifications of this nature concern the person interested, who must act on his own responsibility and will be subject to the consequences resulting from the provisions of the existing law.

Every person who desires to obtain a patent in Spain must deliver at the office of the secretary of the civil government of the province in which he is domiciled, or at any other province where he elects to live for the purpose, the following documents:

Documents Must Be Filed

1—A petition to the minister of commerce, in which he indicates a single object for the patent, stating whether the said object is a new and original invention or not, and the domicile of the applicant, or his attorney. In the latter case the power must be annexed to the petition. It must contain neither conditions, restrictions, nor reservations.

2—A specification in duplicate, in which shall be described the patent, all with the greatest possible clearness, so there can at no time be the least doubt as to the object or the particular represented to be a new and original invention. At the foot of the specification there must be a note expressing clearly, distinctly and particularly which part, piece, movement, mechanism, operation, process, or matter is claimed as the object of the patent. The patent will depend entirely on the contents of said note. The specification must be written in Spanish, without abbreviations, corrections, or erasures of any kind, on sheets folded and numbered. References to weights and measures must be given according to the metrical decimal system. Furthermore, the specifications must not contain conditions, restrictions or reservations.

3—The drawings, samples, or models which the interested party thinks necessary for the comprehension of the descriptive specification, all in duplicate. The drawings must be made on cloth paper in ink, and according to the metrical decimal system.

In addition to the above requirements there must be deposited the receipt for the payment of the first annual tax and a signed list of all the documents and objects presented, which latter must be signed by the applicant or his attorney. When the secretary of the civil government receives all the documents mentioned above he will enter, in a special register, the day, hour and minute of the presentation, sign the list jointly with the interested party or his representative, and deliver a proper receipt. The entry in the registry of presentation indicating the day, hour and minute of presentation will establish the right of priority of the applicant. When all these formalities have been attended to, the application is sent to the secretary of the conservatory of arts, who compares the two copies of the specifications and drawings to satisfy himself of their identity, after which he signs them and forwards them to the minister of commerce. If the latter passes favorably on the application he will then inform the director of the conservatory of arts, who publishes the fact in the Madrid Gazette. Within 1 month from the date of such publication the patentee or his representative must appear at the conservatory of arts to pay in government paper the value of the stamp, which must be put on the patent document. When such payment is made the director of the conservatory of arts will inform the minister of commerce, who will immediately issue the patent of invention. A few minor formalities are then indulged in, after which the patent is valid. At the head of the patent will be printed the following in large letters: "Patent of invention, without guarantee of the government as to the novelty, fitness or utility of the object for which it is granted."

Patented inventions must be worked in the Spanish dominions within 2 years from the date of their granting. Working must not be discontinued for more than 1 year.

Russia's Patent Laws

Under the Russian patent law the right to the patent belongs to the inventor or to his assignee. The patent is granted to the first applicant. If the petitioner lives abroad, he must appoint a representative living in Russia. Patentable inventions consist of inventions which present an element essentially new, either in whole or in one or several of their parts or in the original combination of their parts when they are already known separately. Certain inventions are excluded from protection, among them being those which represent scientific discoveries and abstract theories, and those which previous to the application for the patent have been patented in Russia or have been used there without a patent or which have been described in print in a manner sufficiently complete to be reproduced. Patents which are known abroad without a patent or which are there patented in the name of a person other than the petitioner, except in case the invention shall have been assigned to the latter, are also excluded from protection, as well as those which do not represent a sufficient nov-

elty, but constitute trifling modifications of inventions already known.

The Russian law provides for two kinds of patents. The first is for patents of invention, the duration of which is 15 years, to start from the date of the signing of the patent. The second is for "patents of addition," which expire with the principal patent to which they refer. A patent granted for an invention already patented abroad previous to the date of the filing of the application in Russia expires as soon as the patent or one of the foreign patents of anterior date has ceased to exist.

System of Taxes

An elaborate scheme of taxes on patents of invention is provided by the Russian law. The filing fee for patents of invention is $23.16, while the yearly taxes are as follows: First year, $11.58; second year, $15.44; third year, $19.30; fourth year, $23.16; fifth year, $30.88; sixth year, $38.60; seventh year, $56.90; eighth year, $77.20; ninth year, $96.50; tenth year; $115.80; eleventh year, $154.40; twelfth year, $193; thirteenth year, $231.60; fourteenth year, $270.20; fifteenth year, $308.80. The tax on patents of addition is $23.16 for the term of the patent.

Applicants for a Russian patent should address their applications to the department of trade and manufactures, with the heading, "To the committee of technical affairs, St. Petersburg." The application must be written upon a sheet of paper of ordinary size, furnished with two stamps of 80 copecks and containing a request for the granting of a patent for the invention indicated in the description and the title of the invention, corresponding to the nature of the latter. With the application should be included a memorandum of the documents inclosed, the principal of which are the description, the explanatory drawings, the receipt for the filing fee of $23.16, and, the case requiring it, the power of attorney in favor of the representative. The application must be signed by the petitioner or by his representative, signing by power of attorney, which in the case of a foreign applicant must be legalized.

Describe Patent in Russian

The description of the invention must be written in the Russian language and be clear and plain. It must be accompanied, if the case requires it, by drawings and models sufficiently plain to enable one to reproduce the invention. At the end it must contain an enumeration of the distinctive particulars of the invention. The description must be written on paper of ordinary size, in duplicate, and be signed by the petitioner or his representative. A stamp of 80 copecks must be affixed to each sheet of one of the copies.

The drawings must be in black lines, on thick white drawing paper. Their size must be 13 inches long by 8 inches in width, or 13 inches by 16 inches, or 13 inches by 24 inches. Each drawing must be surrounded by a margin of about 1 inch. Upon the upper margin must be indicated the application to which the drawing relates. The addition of explanatory words and the use of colors are prohibited. The drawings must be filed in duplicate, one of which must be on drawing paper and one on tracing cloth. The usual designation of the figures—i. e., "Fig."—must not appear on the drawing.

Power of Attorney

The applications presented by the representative must be accompanied by a power of attorney. If the petitioner is living abroad and if the power of attorney is written in a foreign language, this power of attorney must bear the signature of the local Russian consul, certifying it is executed according to the laws of the country, and be accompanied by a certified translation in the Russian language. If the invention is already patented abroad, the application must be accompanied by a certified copy of that foreign patent which is the first to expire. If the patent is asked for an invention patented abroad in the name of another person, the petitioner must file a certified assignment stating that he has received the exclusive right to use the invention in Russia.

The filing of models is required if it be necessary in order to easily reproduce the invention. The applicant for a patent who has complied with the prescribed formalities receives a certificate of protection, which permits him to use his invention, to make it known, and to threaten infringers with prosecution. This certificate ceases to be in force if a patent is denied. The application is submitted to the committee of technical affairs of the department of commerce and manufactures, which determines whether the application and the description of the invention answer to the conditions established by law. These researches do not bear either upon the utility of the invention or upon the existence of the right of the petitioner. In case of refusal of a patent the interested party can appeal within 3 months to the department of commerce and manufactures. Patented inventions must be worked in Russia within 5 years from the grant of the patent.

MOTOR CAR ROUTES ON THE CONTINENT

Washington, D. C., Nov. 21—In response to numerous requests the state department has secured the interesting information concerning the motor car routes in European and Asiatic Turkey, which will prove valuable to American motorists who are planning tours abroad. It appears this is the first year that motoring in any form has been allowed in the Turkish empire. The imperial irade was issued in the latter part of 1907, and the spring season this year saw several motor cars on the roads adjoining the city of Constantinople. The Turk hails them with pleasure, and the rich pashas and other notables will be using them soon instead of the highly trapped horses and Parisian carriages now so much in evidence. The roads in Constantinople are badly paved. The streets of Galata and Stamboul can be traversed only at slow and careful pace, and this will be the case until the public grows accustomed to the motor car. The swarms of carriages plying for hire would astonish even the promoters of the numerous taxicab companies in London, and these enterprising hustlers would reap a rich harvest in Constantinople. The roads outside of the city on the European side afford an excellent run to the Sweet Waters of Europe, with a stiff hill to climb coming back. To this spot the whole of the pleasure-loving section of the population goes on Fridays and Sundays, mostly in carriages.

The return route to Constantinople is through Chicili, a residential quarter. Subsequently one passes through Nichantache, where many wealthy Turks have their dwellings, and in this neighborhood the roads are quite good, as also they are along the shores of the Bosphorus. The road continues to be favorable as far as Bebek, the residence of the khedive of Egypt, where it deteriorates, but from Stenia there is lovely running through the great summer embassy quarter of Yenikeuy and Therapia, and miles farther to the mouth of the Black sea at Kavak. Thence one can drive along the top road to the city again. From the city, in the direction of Europe, the roads are a little rough to Macrikeuy, but from Macrikeuy to St. Stephano, and on the lovely gardens that abound at Tchekcheme and the interior of European Turkey they give rise to no complaints.

As to the Asiatic side of the Bosphorus, there are long stretches of good road from Haidar Pacha to Moda, and on to Fanaraki and Erenkeuy, and indeed right along the side of the Gulf of Ismit for about 60 miles. Another satisfactory route is the one to Tchamlidja and the forest of Allemdagh, where one is able to enjoy lovely scenery and macadam roads. The main roads to be recommended are from Samsun to Sivas, a distance of over 217 miles; Sivas to Diarbekir, 295 miles; Trebizond to Erzerum, 202 miles; Angora to Yosgat, 143 miles; Sinope to Bayabad, 75 miles; Kastamuni to Kraugueri, 77 miles; Aintab to Aleppo, 102 miles; Adalia to Burdur, 84 miles; and Panderma to Edremid, 125 miles. All these roads are tolerably easy, with even surfaces.

Answering several inquiries from ardent American motorists as to the possibility of easily reaching the ruins of the ancient cities of Ephesus and Pergamus from Smyrna, a government official says these two roadways are the worst in the country.

From the Four Winds

N S E W

EMPLOYES OF THE FRANKLIN COMPANY LEAVING PLANT AT NOON

May Sell Readville Track—There is talk now of selling the famous 1-mile track at Readville, Mass., where the Bay State A. A., of Boston, holds its annual race meets each year. If that is done there will be no track available for racing anywhere near Boston and the Boston club will lose one of its effective means of revenue.

Hoosiers Active—Road building continues unusually active in Indiana, and it is probable that Hamilton county, of which Noblesville is the county seat, will lead the record for the year. Nine new roads have just been ordered and will cost $80,000, bringing the total expenditures for roads in the county during the present year up to $500,000.

Means Business—The county board of Jefferson county, Wis., has appropriated $8,400 for machinery and $4,000 for the highway reserve fund, to be used in building highways during next summer. This county is one of the most progressive in Wisconsin in highway improvement. A. R. Hoard, of Fort Atkinson, is county highway commissioner, and he spent the last summer almost entirely in superintending road construction. He is a member of the Wisconsin State A. A.

Club in Earnest—That the Automobile Club of Hartford is determined to force observance of the provisions of the present motor car regulation is evident from the action just taken by the club attorneys. Several prominent members have been notified to appear before the board of governors. The law breakers will be given a hearing, and in two or three instances application probably will be made to the secretary of state for the revocation of license. As matters now stand several daily newspapers in the state have taken a decided stand against motorists and are clamoring for the repeal of the present law. Hence it is up to some one to do a little missionary work and the local club intends to do its share. Various other clubs in the Connecticut Automobile Association will have the disturbing element on the carpet.

Play Fair—In order to awaken motorists to a sense of fairness in traveling throughout the central and western part of Massachusetts the Springfield A. C. has had printed a lot of cards which have been distributed in hotels, garages, etc., in and about that city. These cards ask the motorists to observe the laws. They also state that unless there is a better spirit shown by motorists in that section the club will go out and establish a series of traps. The motorists from other states in big cars come whirling into Massachusetts and some of them have no regard for the laws. As there is a penalty attached to the law, for operating a car without a license in Massachusetts unless the person driving the machine is the owner of it, some of the speed maniacs may find themselves facing two charges at the same time.

Just as Good as Train—O. Z. Bartlett, a director of the Milwaukee Automobile club, has returned home from Toledo, O., after a long run in a Pope-Toledo. With a party of five, the Bartlett touring car ran from Milwaukee to Toledo, 384 miles, in 15 hours 16 minutes. From Chicago to South Bend was made in 4 hours flat. From Bryan to Toledo, 63 miles, the time was 2 hours 10 minutes. An average of 25 miles an hour was maintained. Harry Nelson was at the wheel continuously for 12 hours, Mr. Bartlett himself driving the remainder of the time. Mr. Bartlett's primary purpose was to transact some business at Toledo in a hurry, and he says he made comparatively as good time as train, and had all the joys and pleasures of an outdoor ride in the brisk fall air.

Rhode Island Hill-Climb—The Rhode Island A. C. has completed arrangements for its annual hill-climb, which is to be held next Saturday on what is known as Dolly Cole hill at Foster. Entry blanks were sent out early in the week and it is expected that there will be a good representation of cars in the climb. A number of Boston and Worcester motorists will be on hand and it is expected that some of them will enter. This competition will close the local racing and touring season of the club, it being the second event promoted by the club this year. The hill is approximately half a mile long, with an average grade of 7 percent. It is well graded and in good shape for the meet.

Pittsburg Club Booming—The Automobile Club of Pittsburg is organizing a new effort to largely increase its membership before the next season begins. The club has a magnificent new building at Baum and Beatty streets, East End, and its $10 entrance fee and annual fees of $20 are considered very low, inasmuch as the club furnishes splendid accommodations and entertainment and also supplies route slips, road maps and the official A. A. A. Blue Book. The officers of the club at present are: President, Edward Kneeland; first vice-president, William N. Murray; second vice-president, James Carothers; third vice-president, Joseph B. Shea; secretary, Paul C. Wolff; treasurer, George C. Glass.

New Maps Planned—The Automobile Club of Philadelphia has appropriated money to revise the map tentatively issued last year and to issue four additional maps by March 1 next. These maps will cover territory as far east as the Delaware river, as far north as Easton, as far west as Lancaster, and south to within 6 miles of Wilmington, Del. Macadam roads, stone roads fit for spring traffic and dirt roads will all be plainly indicated. The committee in charge of this work is also engaged in the completion of maps of the water gap region and the country beyond Lancaster. New radiator emblems, incorporating the A. A. A. insignia and the words "Pennsylvania Motor Federation" and "Philadelphia," are being delivered to members. The club showed its up-to-dateness by issuing warning bulletins and posting men with flags to give motorists tips as to the location of traps on the main route from Philadelphia to Princeton when several hundred motorists drove there to see the Princeton-Yale football

game. It also gave notice of the bad stretch of road between Jersey Shore and Lock Haven, on the Williamsport-Altoona route. Five miles between the points mentioned is simply impassable owing to repairs being made.

Must Stop Scorching—Denver city officials are bent on stopping reckless driving of motor cars in the city limits. Commissioner Hewitt proposes to punish violators by confiscating the motor cars, just as concealed weapons are confiscated. In case of serious or fatal injuries attributed to the careless driver he would have the car sold to pay damages that may be demanded. In case of less serious effects he would have the city hold up the car for 30 to 60 days, then returned with the warning that a second offense would mean confiscation.

Bear Hunt in Car—Modern and antiquated methods were strongly contrasted recently at Canaseraga, a village not far from Hornell, N. Y. For 2 months a wild bear roamed in that vicinity, frightened children and killed several cattle. Although several citizens armed themselves with guns and clubs they were unable to kill the bear. Harry Scott and Frank Mapes, two young men, finally entered their motor cars and soon had occasion to have a merry race along a country road with the animal. They finally overtook and shot him.

Banquet Is Booked—The Quaker City Motor Club will inaugurate its winter social season on Wednesday night, December 2, with a banquet at the Hotel Walton. This function will be the first of the kind in the club's history, its activities being hitherto more along sporting lines. A score or more of celebrities, including Governor Stuart and Mayor Reyburn, besides other state and municipal dignitaries and the high lights of motordom will be present as guests. The committee in charge of the symposium is composed of Frank Hardart, chairman; First Vice-President A. T. James, W. J. Donnelly, M. D., M. E. Brigham and L. E. French.

Blind Man Drives Car—One of the novel sights witnessed by residents of Saco, Me., a few days ago was a motor car driven by a blind man. Charles N. Underwood, one of the prominent residents of that city, was stricken blind a few years ago but since then he has done many things, such as shingling his own house and building others. So last Friday he dropped into a local garage determined to take a motor ride. He had often talked about the mechanism with workmen and had made himself familiar with the levers, etc., but when he asked to be allowed to drive a car the motorists demurred. He insisted Friday that he be given a chance and he won his point. He drove up Scammon street as straight as an arrow, gracefully turned the corner at North street, then along the road to Elm street, where he made another turn, and back home to the garage again. Naturally the people were astonished, and some of them believed that he had recovered his eyesight.

Governors Confer—The six governors and the six governors-elect of the New England states met in Boston Monday to discuss highways and motor cars, and there was a large audience present at the Tremont theater when Governor Guild called the meeting to order. Boston dealers were well represented, as well as some from Providence, Springfield, Worcester and other cities.

Hamlin Does Fast 10 Miles—After being lost for 4 hours of darkness out on an Arizona desert last week R. C. Hamlin, of Los Angeles, drove his Franklin Greyhound into Phoenix, Ariz., and as a sequel to his experience in the Los Angeles-Phoenix road race put the car at once upon a circular track and drove 10 miles in 10:41. The second mile was done in 1:00 flat. This is claimed as a record for stock cars.

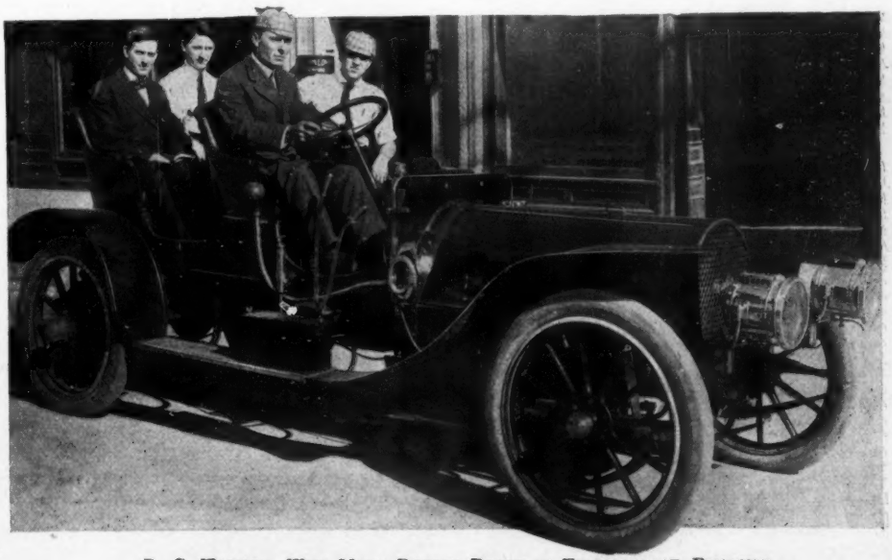
Hotels Wake Up—Until now Indiana hotels have been slow in providing garage accommodations for their guests. The West Baden Springs hotel at West Baden, however, has just realized that such a building is a necessary addition if the patronage of the motor car people is to be gained. A large fireproof, brick building is being erected, the first floor of which will be used as a garage. The two upper floors will be used as an addition to the hotel.

Fritchle on His Way—O. P. Fritchle, builder of the Fritchle electric, is still on his way to New York. Mr. Fritchle left Lincoln, Neb., October 31, 19 days prior to his arrival in Pittsburg last Thursday. After spending 4 days in Chicago he traveled the 300 miles to Toledo on four charges and facing 2 days of snowstorm. On the way, at Mt. Hope, O., he spent 2 days with relatives. Counting out the non-traveling days, he covered 1,300 miles between Lincoln and Pittsburg in about 13 days. About a week, it is expected, will be spent in New York. Then he goes to Washington, D. C., and then starts on the return trip west in the same Fritchle electric.

Diamond Paving Street—The city of Akron, O., has profited in many ways by the growth of rubber manufacturing, but the most unique benefit yet to develop is an agreement made by the Diamond Rubber Co., by which the latter concern is to pave nearly an entire street at its own expense. The Diamond tire concern desired the vacation of a small portion of the street so as to connect recent large additions to its older buildings. An offer to pave the remainder of the street in return for this was accepted. The work involves a $20,000 expenditure.

May Extend Pike—Motorists in Washington, D. C., are greatly interested in a movement that has been started to extend the famous Shenandoah valley pike from Staunton to Richmond, Va. The project has the indorsement of financiers in all the cities and towns between Winchester and Richmond. From Hagerstown, Md., through Martinsburg, W. Va., Winchester, Strasburg, Woodstock, Harrisonburg and to Staunton, Va., there is a fine turnpike 140 miles long, and with an extension to Richmond, it will be a highway about 225 miles in length, without a break.

Elmira Club Reorganized—The Elmira Automobile Club, composed of enthusiastic motorists of Elmira, N. Y., has been reorganized with the following officers: Clay W. Holmes, president; F. N. Dounce, vice-president; Fred H. Rees, secretary; Elwood B. Crocker, treasurer. A campaign will be inaugurated for new members and a social will be arranged for the members in the near future. The old constitution and by-laws were amended, making the annual meeting in May. The entrance fees and dues were also reduced. Dues will now be $2 per year and the admission fee will not be required until after next April.



R. C. Hamlin, Who Made Record Drive in Franklin at Phoenix

HEAT TREATMENT OF STEEL FOR MOTOR CARS

THE latter day practices of the makers of motor cars take into account, primarily, material soft enough to be worked on a commercial basis. Since the materials have to serve for divers purposes, they have to be rendered hard or dynamic and in other states, depending upon the service. It is possible to start in with certain selected grades of steel, initially soft, but susceptible of transforamtion, if heat treatment is resorted to. In this article an attempt will be made to expose to view some of the methods by which initially good steel may be readily fashioned into shape and thereafter rendered hard or soft, ductile or dynamic, as the exigencies of the service may demand.

There are dozens of detailed ways of heat-treating steel, but the principal remains the same in all, differing perhaps as respects temperature and time, calling into play the influences of quenching baths, and the effect of varying rates of time, in heating and quenching. The following tabulation will suggest some of the variations, and it may serve to indicate the desirability for system and a well-defined uniformity in practice:

ANNEALING

No.	Quench Temp. deg. C.		Anneal. Temp. deg. C.	Quench media.	Anneal. media.
A—	...		350	... Lime	
B—	...		750	... Lime	
C—	...		800	... Lime	
D—	...		850	... Lime	
E—	...		900	... Lime	
F—	...		950	... Lime	
G—	...		1,000	... Lime	
H—	...		1,050	... Lime	
I—	...		1,100	... Lime	
CEMENTING AND TEMPERING					
J—	800	...	250	Water	Bismuth
K—	850	...	250	Water	Bismuth
L—	900	...	250	Water	Bismuth
M—	950	...	250	Water	Bismuth
N—	800	...	300	Water	Lead
O—	850	...	300	Water	Lead
P—	900	...	300	Water	Lead
Q—	950	...	300	Water	Lead
HARDENING					
R—	750	...	...	Water	
S—	800	...	...	Water	
T—	850	...	...	Water	
U—	900	...	...	Water	
V—	950	...	...	Water	
W—	1,000	...	...	Water	
X—	1,050	...	...	Water	
Y—	1,100	...	...	Water	
Z—	750	...	...	Oil	
AA—	800	...	...	Oil	
AB—	850	...	...	Oil	
AC—	900	...	...	Oil	
AD—	950	...	...	Oil	
AE—	1,000	...	...	Oil	
AF—	1,050	...	...	Oil	
AG—	1,100	...	...	Oil	
HARDENING AND TEMPERING					
AH—	750	...	250	Water	Bismuth
AI—	800	...	250	Water	Bismuth
AJ—	850	...	250	Water	Bismuth
AK—	900	...	250	Water	Bismuth
AL—	950	...	250	Water	Bismuth
AM—	1,000	...	250	Water	Bismuth
AN—	1,050	...	250	Water	Bismuth
AO—	1,100	...	250	Water	Bismuth
AP—	750	...	250	Oil	Bismuth
AQ—	800	...	250	Oil	Bismuth
AR—	850	...	250	Oil	Bismuth
AS—	900	...	250	Oil	Bismuth
AT—	950	...	250	Oil	Bismuth
AU—	1,000	...	250	Oil	Bismuth
AV—	1,050	...	250	Oil	Bismuth
AW—	1,100	...	250	Oil	Bismuth
AX—	750	...	300	Oil	Lead
AY—	800	...	300	Oil	Lead
AZ—	850	...	300	Oil	Lead
BA—	900	...	300	Oil	Lead
BB—	950	...	300	Oil	Lead
BC—	1,000	...	300	Oil	Lead
BD—	1,050	...	300	Oil	Lead
BE—	1,100	...	300	Oil	Lead
BF—	750	...	350	Oil	Oil
BG—	800	...	350	Oil	Oil

EDITOR'S NOTE—In the following article Thomas J. Fay, president of the Society of Automobile Engineers, discusses the improvements in motor car construction wrought by heat-treating steel. The article will be continued.

HARDENING AND TEMPERING

No.	Quench Temp. deg. C.		Anneal. Temp. deg. C.	Quench media.	Anneal. media.
BH—	850	...	350	Oil	Oil
BI—	900	...	350	Oil	Oil
BJ—	950	...	350	Oil	Oil
BK—	1,000	...	350	Oil	Oil
BL—	1,050	...	350	Oil	Oil
BM—	1,100	...	350	Oil	Oil
BN—	750	...	550	Oil	Salts
BO—	800	...	550	Oil	Salts
BP—	850	...	550	Oil	Salts
BQ—	900	...	550	Oil	Salts
BR—	950	...	550	Oil	Salts
BS—	1,000	...	550	Oil	Salts
BT—	1,050	...	550	Oil	Salts
BU—	1,100	...	550	Oil	Salts
BV—	750	...	300	Water	Lead
BW—	800	...	300	Water	Lead
BX—	850	...	300	Water	Lead
BY—	900	...	300	Water	Lead
BZ—	950	...	300	Water	Lead
CA—	1,000	...	300	Water	Lead
CB—	1,050	...	300	Water	Lead
CC—	1,100	...	300	Water	Lead
CD—	750	...	350	Water	Oil
CE—	800	...	350	Water	Oil
CF—	850	...	350	Water	Oil
CG—	900	...	350	Water	Oil
CH—	950	...	350	Water	Oil
CI—	1,000	...	350	Water	Oil
CJ—	1,050	...	350	Water	Oil
CK—	1,100	...	350	Water	Oil
CL—	750	...	550	Water	Salts
CM—	800	...	550	Water	Salts
CN—	850	...	550	Water	Salts
CO—	900	...	550	Water	Salts
CP—	950	...	550	Water	Salts
CQ—	1,000	...	550	Water	Salts
CR—	1,050	...	550	Water	Salts
CS—	1,100	...	550	Water	Salts
CT—	750	...	650	Water	Salts
CU—	800	...	650	Water	Salts
CV—	850	...	650	Water	Salts
CW—	900	...	650	Water	Salts
CX—	950	...	650	Water	Salts
CY—	1,000	...	650	Water	Salts
CZ—	1,050	...	650	Water	Salts
DA—	1,100	...	650	Water	Salts

It will be to no purpose to attempt to improve upon the language of "Harboard"* in his definition of "tempering," viz., "The hardness conferred upon steel by rapid quenching is not suitable for any industrial purpose, and has to be modified or 'tempered' to suit the particular requirements of the case. This may be done by reheating the hardened—quenched—steel to different 'temperatures.' The operation of tempering may therefore be defined as modifying the degree of hardness conferred upon steel by quenching, by heating to certain definite temperatures, and slowly or rapidly cooling. Tempering reduces the brittleness and the hardness and considerably increases the toughness and ductility of the materials, and by varying the conditions of heat treatment almost any required degree of hardness may be produced."

In annealing steel it will be well to remember that the process will be most beneficial as a rule if the steel is heated to a point above Ar_1 by a margin of about 30 degrees C. in some grades, a matter depending upon the carbon content.

*Harboard: The Metallurgy of Steel.

Value of Modes of Treatment

It is not claimed that all the heat treatments given in the tabulation will be found valuable for use; on the other hand, the contrary will be found true. It is the idea to afford a wide range of specific forms of heat treatment, and in so far as it is possible to do so, extend proof of the value or otherwise of the several modes of treatment.

It will be understood the treatment proper for one grade of steel would be fatal for another. It follows that there may be grades of steel demanding some one of all the formulæ given under some one of the several likely conditions. It is better to afford a diversity of formula, rather than to restrict the same, merely to court brevity. The table in question, in itself, offers no suggestion of the exact treatment to use in any given case nor does the same table include every possible treatment.

The table, together with some data on the subject, should, however, materially aid in the process. It is by far better to be able to identify the respective modes of procedure in some way, than to go about it haphazard. As regards the steel itself, there are several points that can be regarded as more or less fixed. It will be possible to set down these points as follows:

1—Steel for "cementing," or case hardening, may be alloyed or not; but it should be low in carbon. If the same is alloyed, the carbon should be lower than if the steel were of the carbon-steel genus.

2—Iron almost devoid of carbon may be case-hardened, or cemented, but the time required to grow a depth of carbon will, of course, be comparatively great in iron or in mild steel.

Process of Cementing Steel

Cementing steel is also a product singularly free from impurities when the results are noteworthy.* Krupp cementing steel, for illustration, rarely has more than ten points of carbon, no matter what the other components may be. This is provided the steel is for "cementing." In this steel the sulphur and phosphorus are both held very low, indeed, and the manganese does not exceed 0.50 per cent. What is meant by low sulphur and phosphorus is something to define in view of the great diversity of opinion of this phase of the subject.

Sulphur limitations, in motor car work:

0.010 per cent = a very satisfactory low limit;

0.015 per cent = a moderately satisfactory point;

0.020 per cent = the top limit for capital results.

Phosphorus limitations, in motor car work:

0.010 per cent = a very satisfactory low limit;

0.015 per cent = a moderately satisfactory point;

0.020 per cent = the top limit for capital results.

It is not impossible to use steel if the sulphur and phosphorus are in excess of the top limits given, but the idea here is

*Freid Krupp A. G. Essen un Ruhr.

to fix the range of desirable contents. In heat-treated steel there are many things to conspire against the user of inferior steel, and the chances of ill results are so great as to demand the use of none but the finer grades of steel.

The silicon should, in most cases be low as well; in fine it seems, the nearest approach to pure iron plus the alloying elements, would best serve the purpose. Then the carbonizing process may be conducted under conditions of the greatest possible safety and the "failures" will be few and far between. The usual object in cementing is to attain extraordinary results, hence it would seem as if the steel should be of extraordinary quality. Indeed, it is true of steel that the "metalloids"† should be as low as possible anyway, whether the steel is for case-hardening or not. If steel is not to be "cemented" and it is desired to render the same hard by quenching, the carbon must then be higher—than that in cementing steel—by a considerable amount. In carbon steel, it is true, that if the carbon is below 20 points, there will be no appreciable increase in hardness as the result of quenching from even very high temperatures. Obviously, then, the carbon must be above 20 points if the hardness is to be due to the effect of quenching.

If the carbon is up to about 40 points, quenching will result in a very considerable hardness, while if the steel holds nickel, chromium, tungsten or vanadium, the hardness will be more pronounced. If, on the other hand, great hardness is demanded from strictly carbon steel, the carbon should be even up to 90 points. If the steel is to be tough as well as hard it is a matter of oil quenching and subsequently tempering. Water quenching alone results in great hardness, but the steel would be brittle. Subsequent tempering would reduce the brittle character of the steel, while oil treatment, on the other hand, imparts far greater toughness.

Needs Higher Carbon Content

The carbon content then should be fixed higher for carbon steel than would be required for alloy steel, if the hardness is to be as a result of quenching and subsequent annealing, rather than by the cementing process. There are some practices to be condemned in connection with the hardening of steel, especially alloy steel, as, for illustration, the use of cyanide of potassium. It is not well to raise the temperature of one end of a piece of steel to a point high enough to engender hardness as a result of quenching after immersing the same in the cyanide. If one part is raised to a high temperature, and the other part is kept at a lower temperature—black—the result is, a zone between the hardened and the soft parts, which is neither one nor the other of the conditions that should obtain. The cyanide of potassium seems also to be incapable of imparting a safe hardness to the steel unless the steel itself is very low in carbon and free from alloys. In that event the depth of the hard skin is but microscopic and of no value in actual practice.

It is not uncommon to see camshafts with cams hardened by applying the flame of a bunsen burner to the cams, raising the heat to a high point—how high no one knows—then the cyanide is daubed over the heated surfaces and the quench is applied. It is plain enough that the purchaser of a motor car who has cams thrust upon him—hardened in this way—will not be afforded an insight to the fact in the "elusive" literature of the publication department of the makers of such motor cars.

The structure intervening a hard and a soft layer may be good and it may not. It is satisfactory in the cemented work, if the steel is primarily a low-carbon product. It is not satisfactory if the whole of the member is not raised to the same temperature. It is not proper to heat one end of a member and leave the other end cold. There is a junction of the two conditions that will not be equal to the other portions of the member in point of hardness, on the one hand, and of strength on the other.

From these crude methods of spoiling steel, in the attempt to harden it, to the most approved methods of heat treating is a long way. What is wanted for the most signal success is a complete equipment knowledge of its use, and the requisite qualities of the steel.

Required Equipment for Heat Treating

1—Exact means of determining the temperature.

2—Suitable means of attaining any temperature up to 1,400° C.

3—Exact means of maintaining a constant temperature for long periods of time.

4—Means for quickly adjusting the temperature and changing the same.

5—Means for protecting the steel to be treated from contact with objects that would tap the heat and render the temperature uneven.

6—Means for slowly raising the temperature of the parts to be heat-treated.

7—Means for slowly cooling the part to be heat-treated.

8—Means for quickly lowering the temperature of the parts to be heat-treated.

9—Suitable tools for deftly handling the parts without exposing them to air, or to such outside influences as would abort the desired action.

10—Arrangements of the equipment such as would protect the manipulator from the poisonous fumes of the chemicals which are used in such process.

11—An adequate forging plant.

In general there are two main methods of proceeding with the heat-treating process. The first is the one in which the parts to be treated are exposed to the burning gases and the atmosphere to a certain extent, and, the second, is a process by which the parts are submerged in a media of metallic salts, and the whole is raised to the desired temperature. In this way the parts to be treated only contact with the salts and the temperature is held quite uniform throughout the mass. The salts protect the steel from contact with the air or gases during the process. Of the two methods, the second is much to be preferred, yet even so, it is the method least used.

Muffle Furnaces First Method

Muffle furnaces belong to the first method of heat treating, in which coal-gas is used as the source of heat. They work very well, indeed, and a good manipulator can deliver splendid product as a result of their deft use. It is not possible to protect the steel, however, from contact with the products of combustion, and it is not easy to uniformly heat the steel throughout its section, especially if the parts are bulky. It cannot be said the muffle furnace temperature may be measured with great accuracy, nor will one be sure that the temperature of the parts to be treated, will be the temperature as shown by the "pyrometer."

The pyrometer only contacts with the hot gases and not with the parts to be hardened. On the whole, however, the work done by the muffle furnace in the hands of a skilled manipulator is not to be harshly criticised, because the results are truly good. Certainly, the muffle furnace is a vast improvement over an open fire of any kind. It is also a fact that the muffle furnace is superior to a bunsen burner, by means of which a hot blast is directed against the parts to be heated. Surely, this is not the way to realize good results. Certainly, it is not possible to maintain uniformity, if a bunsen flame is applied to one side of a piece and the other side is exposed to a cold draught.

The muffle furnace has the advantage of affording an indirect and uniformly heated atmosphere. This atmosphere does not seem to hold in its composition, elements or conditions such as tend to destroy the structure of the steel. On the other hand, it is not to be said that the atmosphere of the muffle furnace is the best possible. The exact atmosphere of the muffle furnace cannot be stated because the condition is one of partial combustion interstratified with the products of combustion. The coal-gas itself is a consider-

†Sulphur and phosphorus are classed as metalloids.

able variable, but it might approximate the composition as follows:

Principal Constituents of Coal-Gas

Formulæ	Names		Volumetric per cent
H	Hydrogen		25 to 50
	Light carburetted hydrogen		35 to 52
C_2H_2	Acetylene	Convertible Hydro Carbons	3 to 20
C_3H_6	Propylene		
C_4H_8	Butylene		
C_2H_4	Acetylene	Carbureters	?
$C_{10}H_8$	Naphthalene		
C H_2	Carbonic acid		0 to 2
C O	Carbonic oxide		0 to 2
C N	Caynogene		5 to 9
N H_3	Ammonia		0 to 0.06
C S^2	Bisulphate of carbon		to 0.004
H_2O	Aqueous vapor		to 2.5
N	Nitrogen		to 8
P	Phosphorus		trace

Carbonic acid, carbonic oxide and water would constitute the chief products of combustion, the carbonic oxide would, of course, only be present if the combustion were incomplete. The nitrogen would remain as such, inert, and to these products must be added the atmospheric air requisite to dilute the gas for burning.

It has not been claimed by many who have taken an interest in the question of heat treatment of steel that the contact of the heated steel with the products of more or less complete gaseous combustion would lead to any ill results. That the steel will be in a more or less receptive state is not to be denied, hence it is a matter not to be entirely disregarded, this question of the contact of the steel with the atmosphere in which it is heated.

The more recent experiments on the subject tend to indicate that the atmosphere in which the steel is raised to a high temperature, does influence the situation in more ways than one. Nitrogen, for illustration, seems to increase the penetration of carbon. If parts to be cemented are packed in cementing materials and an excess of nitrogen is constantly supplied in any suitable way, the penetration of carbon will be to a greater depth in a given time.

If the cementing materials are high in nitrogen, the same results will follow, to a less extent, in all probability. If, however, it can be shown that nitrogen increases the penetration of carbon in steel at a cementing temperature, this is equal to saying the gas atmosphere in contact with the incandescent steel will influence the results, for good or ill. If we do not know the extent of the changes that may result, we do not know if the changes are beneficial or otherwise.

Under such conditions it is the safest to eliminate the atmosphere if it can be done with safety. It is not always the case that carbon is to be imparted to the steel, and on some occasions increasing the carbon content is far from the right thing to do. The most approved method of heat treatment of steel must be that in which the steel is submerged in a media of the most beneficial sort. In this way the steel is protected from contact with all but the desired contact media. This summary of the investigations of G. Shaw Scott was in the Horseless Age, February 12, 1908.

G. Shaw Scott, of Birmingham university, in a paper read before the Iron and Steel Institute of Great Britain, shows the influence of nitrogen upon the penetration of carbon into iron or steel in the process of carbonization or cementation. The mixtures employed in cementation by various manufacturers are very numerous, including coke potassium, ferrocyanide potassium cyanides, hydrocarbon vapors, bone, animal horn, graphite, burnt leather, animal black, barium carbonate, etc., either alone or in combination, each maker having a different formula. In every mixture used nitrogen exists under some form or other.

Mr. Scott took a certain number of identical bars of soft steel and subjected them to cementation with various mixtures and under given conditions. The bars were then broken, and their structure examined under a microscope. The first two experiments were made with anthracite and coke. Two bars, one surrounded with coke and the other with anthracite coal, were heated to 900° C. for 4 hours, and showed a penetration of from 0.15 to 0.16 millimeter—0.0059 to 0.0062 inch—only. The third experiment was made with burnt leather under the same conditions as before, and showed a penetration of 0.0622 inch, ten times greater.

Thinking that this was due to the effect of nitrogen, two other bars were taken, one being previously heated to 550° C. in an atmosphere of ammonia for 4 hours, and placed in a special cementation chamber, with a non-nitrogenous agent, as burnt sugar, for 8 hours, during which they were subjected to a constant temperature of 1,000° C. This experiment, after a number of repetitions, showed a ratio of penetration of 45 to 32 between the two bars, the ammonia vapors assisting the penetration of the carbon.

At 1,000° C. cementation can be easily accomplished, since with a non-nitrogenous agent the steel approaches its melting point, and the preliminary ammonia treatment influences the steel during the first few seconds of the process only. Mr. Scott, therefore, built a special furnace in which two boxes could be placed. One of these boxes had a tube for the admission of the ammonia gas; this tube was 0.472 inch diameter and 2.36 inches long, and was screwed into one side of the box, small apertures allowing the escape of gas in the opposite side. The second box has similar dimensions to the first, but had no tube and was hermetically sealed. Bars covered with burnt sugar were placed in each box, and both boxes placed within the furnace, where they were subjected to a temperature of 900° C. for 4 hours. The ammonia gas was passed into the first box during the whole time. The bars were then allowed to cool.

After the bars were withdrawn from the boxes they were examined and showed very different aspects. The bars which were untouched by the ammonia were blue-blackish and were easily cut with a saw, while the others could not be sawed and presented a whitish appearance. The treated bars showed a penetration of .0708 inch, while the untreated bars did not show more than 0566 inch.

It is evident from the above experiments that the presence of nitrogen in cementation acts beneficially in causing a deeper penetration of the carbon into the steel.

Experiment Is Interesting

While the above experiment is very interesting in itself, it is of more interest here in that the reverse point of view tells us that if carbon is not wanted to a great depth, it will be desirable to avoid contact with the nitrogen in such form as to render it potent as an agent. There are other gas problems in the same way, and while time may afford the requisite data by means of which the best results may follow, the fact remains, for the present it is wise to eliminate all unknown quantities.

Bosch Magneto in Vanderbilt

New York, Nov. 23—The Bosch Magneto Co. has investigated the case of magneto trouble on the Chadwick in the recent Vanderbilt cup race and Vice-President E. H. Heins has issued the following statement: "In an effort to establish definitely the true cause responsible for the loss of a position of supremacy attained by the Chadwick in the recent Vanderbilt race, first reported as due to the burning out of a magneto, it has been learned that neither of the Bosch magnetos in use on the car during the race burned out. A report circulated to that effect has proven absolutely false, and since has been recalled by the Chadwick Engineering Works, which founded its first belief on erroneous information. A searching investigation clearly proved that nothing but malicious intereference in the mechanism of the magneto, by a wilful hand, with the apparent object of disabling either the magneto or the car, was responsible for the unfortunate handicap of the Chadwick. With reference to the Renault and No. 7 Matheson, both of which experienced ignition trouble during the Vanderbilt race, as was stated in the various trade papers, it is the general prevailing opinion that these cars were during the race equipped with Bosch magnetos, because this magneto is the standard equipment on cars of their manufacture. For reasons thus far not ascertained another make of magneto was substituted in this particular instance for the Bosch standard equipment. In the case of the Renault car, according to the printed statements, this substitution was accomplished the very night before the race. It is thus evident that wherever ignition trouble was reported the Bosch product was not responsible. In all other cases where Bosch magnetos were employed, ignition gave as usual splendid results."

Brief Business Announcements

Pittsburg, Pa.—The Auto Brokers' Exchange has been appointed agent for the Pullcar.

Lansing, Mich.—The Ford Motor Co., of Detroit, has increased its capital stock from $150,000 to $2,000,000.

Dover, Del.—The Travelers' Garage and Auto Co., of Philadelphia, Pa., has been incorporated in this state with a capital stock of $25,000.

Cleveland, O.—Charles E. Miller has been appointed distributing agent for the Continental Caoutchouc Co. in this city and surrounding territory.

Cleveland, O.—The Zenith Motor Goods Co. has been appointed local agent for the Ke-pa-go-in leather tire, and in addition will carry a line of motor supplies and accessories.

Newark, N. J.—The Weldon & Bauer Co. has been incorporated with a capital stock of $15,000, and will manufacture motor cars, trucks and wagons, and also will conduct a garage.

Trinidad, Colo.—The Hawkins & Barnett Machine Co., of Trinidad, Colo., has sold that part of its business including motor cars, bicycles and novelty business to the Trinidad Novelty Works Co.

Newark, N. J.—The New Jersey Automobile and Motor Club has commenced the erection of a garage in the rear of its clubhouse at Park place and East Park street. The new building is to be simply for the accommodation of the members.

Pittsburg, Pa.—The motor car firm of French & Hoffer, Broad street, Pittsburg, has been dissolved, J. A. French having taken over the business which he will conduct under the name of the J. A. French Auto Repair Co. New machinery is being installed.

Milwaukee, Wis.—The Wisconsin Automobile Exchange has been appointed local agent for the Stearns. The company, of which Arthur Ekstein is the manager, is erecting a two-story garage, 50 by 100 feet, on Wisconsin street, between Marshall and Astor streets.

Columbus, O.—The Zenith Motor Goods Co., of Cleveland, has been incorporated with a capital stock of $25,000. The Airless Puncture Proof Tire Co., of Elyria, is another concern to file articles of incorporation. The amount of the capital stock is not given.

Topeka, Kan.—W. E. Mallory, formerly of the Kansas Auto and Supply Co., of 506 Quincy street, has sold his interest in the concern to A. C. Longren and C. J. Carlson, both of this city. In the future the concern will be known as the Kansas Motor Car Co., and will do general garage and repair business, in addition to handling several makes of cars.

Wilkinsburg, Pa.—C. S. Schroeder has closed his garage here, and is now located in Oakmont.

Los Angeles, Cal.—The Rambler garage will shortly be settled in its new quarters at 1140 South Hope street.

New York—R. G. Howell, who has been connected with both the Northern and Franklin staffs in this city, is now with the Buick company.

Syracuse, N. Y.—The Genessee Garage Co., of this city, has made application for authority to change its name to the Genessee Motor Car Co.

New York—Louis J. Sackett has joined the selling force of Wyckoff, Church & Partridge, and will be in charge of the territory east of Buffalo and Pittsburg.

Springfield, Ill.—The Ford Automobile Equipment Co., of Chicago, has been incorporated with a capital stock of $2,400, and will manufacture, repair and deal in motor cars, etc.

Albany, N. Y.—The Lozier Mfg. Co., of Plattsburgh, has been incorporated with a capital stock of $60,000, and will manufacture motors, engines, machines, cars, carriages, etc. Another new company is the Long Beach Garage Co., of Manhattan,

Boston, Mass.—G. H. Pixley Co., capital stock $50,000; to engage in a general motor car business.

Syracuse, N. Y.—Champion Tire Co., capital stock $100,000; to manufacture tires for vehicles of all kinds.

Beloit, Wis.—E Z Auto Gocart Co., capital $25,000. Incorporators, Frederick Kaplan, Abraham Kaplan and A. Knells.

Bridgeport, Conn.—Astor Motor Car Co., capital $10,000, to manufacture and deal in motor cars.

Albany, N. Y.—Albany Motor Car Co., capital stock $5,000; to deal in motor cars.

Gloversville, N. Y.—Gloversville Garage Co., capital stock $15,000; to conduct a garage.

Buffalo, N. Y.—E. E. Denniston Co., capital stock $30,000; to manufacture motor car bodies, tops, wind shields, etc.

New York—Post Motor Co., capital stock $30,000; to manufacture motors, engines, machines, motor cars, etc.

Cambridge, Mass.—Norris Motor Co., capital stock $50,000; to manufacture motor cars, accessories, etc.

Chicago—Great Central Motor Co., capital stock $25,000; to manufacture and deal in motor cars, motors and machinery.

Chicago—Kissel Motor Co., capital stock $10,000; to deal in motor cars, machinery, etc.

New Haven, Conn.—Baker Mfg. Co., capital stock $5,000; to manufacture and deal in spark plugs and motor car parts of all kinds.

Cleveland, O.—Wright Auto Horn Co., capital stock $35,000.

New York—United States Motor Cab Co. of Manhattan, capital stock $50,000; to deal in and rent cars, cabs, vehicles, trucks, wagons, etc.

which has a capital stock of $50,000, and will operate a garage.

New York—The Motorcar Mfg. Co. Association has leased space in the Terminal building.

Pittsburg, Pa.—Harry Beegle will be connected with the local branch of the Winton company.

Des Moines, Ia.—The Sears-Nattinger Automobile Co. has been granted permission to change its name to the Sears Automobile Co.

Cincinnati, O.—The Eagle Automobile Co. has leased the property at 3139 Reading road, and will at once commence the erection of a new concrete garage.

Los Angeles, Cal.—H. O. Harrison has been appointed agent for the Apperson in this city. He will continue to represent the Oldsmobile and Peerless as heretofore.

Kansas City, Mo.—The Pioneer Automobile Top and Supply Co., of Kansas City, has been incorporated with a capital stock of $2,000, and will manufacture tops and wind shields.

Rochester, N. Y.—The Merbett-Bettys Motor Car Co., of Rochester, has been incorporated with a capital stock of $50,000. It will manufacture motor cars and motor vehicles of all kinds.

Jefferson City, Mo.—The Webb City Automobile Co., of Webb City, has been incorporated with a capital stock of $4,000, and will deal in motor cars, as well as operating a garage.

Trenton, N. J.—The Brick Church Automobile Co., of East Orange, has been incorporated with a capital stock of $100,000, and will manufacture, repair and model motor cars, motor cycles, etc., and will also conduct a garage.

Los Angeles, Cal.—The American Motor Car Co. is shortly to open headquarters at Washington and Main streets, and will handle the American. This car was formerly handled in this territory by the Southern Motor Car Co., but the latter concern has gone out of business.

New York—Frederick J. Goodwin, Inc., who has been engaged in a repair business at 51-55 West Ninety-third street, has assigned for the benefit of his creditors. Frederick Goodwin is the president of the company, Frank V. Goodwin, vice-president, and Walter B. Wayland, treasurer.

Buffalo, N. Y.—The Buffalo Specialty Co., maker of Neverleak fluid and Shinebright metal liquid, has bought the plant of the Thomas Spring Works of Canisteo, N. Y., and transferred all machinery patterns, etc., to one of its Buffalo factories, where the manufacture of Thomas shock absorbers will be carried on extensively.

Among the Makers and Dealers

Contracts for the Ford—Edward F. Mathews, 12 Vine street, Worcester, Mass., has contracted to handle the Ford in that city.

One More in His Line—O. Fenstermacher, the Minneapolis agent for the Firestone tire and the Nadall demountable rim, has closed for the agency of the Jones speedometer.

Union Plant Growing—The Union Carriage Co., of St. Louis, is figuring upon a further addition to its plant. It also has decided to increase its output from 500 to 1,000 cars, a decision reached since election.

Coast Agent for Nadall—Austin Kanzee, manager of the western branch of the Phoenix Rubber Co., with headquarters at 119 Beale street, San Francisco, has been given the coast representation of the Nadall demountable rim.

New Winton Color—A new color combination comes from the Winton factory. The new combination is an exceedingly deep and rich royal purple body color, with black moulding and carmine striping, and Winton carmine running gear color, striped with black.

Luttrell Gets New Place—The Luttrell Co., agent in Washington, D. C., for the Packard and Buick, has leased for a term of years the building at 1028 Connecticut avenue, formerly occupied by the Flynn Motor Car Co. The building will be entirely remodeled before the new occupants take possession.

Fond du Lac Consolidation—The Jackson will have a fine home at Fond du Lac, Wis., when the $20,000 garage now under construction for a stock company headed by Mayor E. W. Clark, and occupying the site of the mayor's residence, is completed. The new company is a consolidation of the Crescent Auto and Machine Co. and the George W. Worthing Auto Co., of Fond du Lac. George W. Worthing is sales manager of the company.

Annual Benz Statement—The net profits of Benz & Co., of Mannheim, manufacturers of Benz cars, amounted to only $131,000 for the business year 1907-1908 ending last June as compared with a profit of $284,422 for the preceding year. Therefore the dividend was cut down from 15 per cent to 8 per cent. During the year the concern has purchased the plant, business and good will of the Suddeutsche Automobile Fabrik, in Gaggenau, which required a large outlay of capital. This did not seem to meet with the approval of all the stockholders as it is claimed the Gaggenauer works were losing money and that the price paid by the Benz people was excessive. At the annual meeting of the stockholders, which was held August 24, it was also stated that hereafter the concern would take part only in a few of the most important annual road races.

CHICAGO PLANT OF TRIPLE ACTION SPRING CO.

Takes on the Franklin—J. F. McLain has just closed a contract with the Hunt Automobile Co., San Diego, Cal., whereby that concern will handle the Franklin in San Diego county.

Buys Plant in Elmira—The Southern Tier Motor Co. has bought the Elmira Arms Co.'s garage of Elmira, N. Y. Guy Shoemaker, of Elmira, and Harry K. Crandall, of Athens, Pa., will be managers.

New Buffalo Concern—The Chester Auto and Tire-filling Co. has been incorporated in Buffalo with a capital stock of $50,000. The directors are Asbury J. Chester, Wilson Chester, Harold Carle and H. C. Harrison, of Buffalo, and Theodore Chester, of Sudbury, Pa.

Rapid Changes—The Rapid Motor Vehicle Co., of Pontiac, Mich., is erecting a new office building to take care of the increased volume of business in that part of its organization. The Rapid company has also added to its official staff as manager of advertising William Ashe Somerville. T. P. Myers, formerly connected with the advertising department, has been made general sales manager.

Muncie Plant Working—Although it has only been 6 weeks since the factory buildings were started, mechanics are now at work turning out the first cars in the plant of the Interstate Automobile Co., at Muncie, Ind. However, the plant is not yet completed and the cars now being made are for exhibition at the shows in New York. The new plant is designed as a model factory building and is composed largely of glass. The building is 440 feet long and about 200 feet wide and the floor is of cement. It is expected that the plant will be ready for full operation about January 1, when about 500 men will be given employment.

In With Adams—G. L. Brett, Jr., who was with the White company in Boston, has gone with Arthur Adams in that city, and he will now handle the Oldsmobile.

Lindsley Appointments—Frank G. Borce has been appointed chief engineer and Albert L. Waters superintendent of J. V. Lindsley & Co., of Dowagiac, Mich., makers of the Lindsley car.

New Cadillac Representative—The American Motor Car Co., recently established at Des Moines, Ia., will handle the Cadillac. It will occupy a new building at 916 West Walnut street. Earl V. Shire, of Milwaukee, will be manager of the company.

Winslow a Tire Man—G. A. Winslow, who has been for 9 years past with the Boston Cycle and Sundry Co., Boston, has joined the force of the Boston branch of the Pennsylvania Rubber Co. Mr. Winslow will be assigned to the bicycle tire department in New England.

Must Be Fireproof—Owners of garages at Fond du Lac, Wis., have been given time until July 1, 1909, to convert their buildings into fireproof structures. All gasoline must be stored underground. The penalty for disobeying the order is to have their places of business closed.

Handling Motor Wagons—The Indiana Carriage Co., of Indianapolis, has taken the agency for the Jackson and also for the trucks and delivery wagons manufactured by Sayres & Scoville, of Cincinnati. This is the second Indianapolis concern to handle motor commercial vehicles. Recently the Indiana Carriage Co. took the Indiana agency for the Regal.

Layman's Change—Harry Layman, who for several years, was assistant general manager of the Toledo, O., plant of the Pope Motor Car Co., and who recently has been associated with the Buick Motor Car Co., has accepted the agency for the latter concern at Cincinnati, O., where he has gone to assume his new duties. He will establish a salesroom in Cincinnati and conduct the business in his own name.

Burdick Made President—To concentrate the interests and permit of its entrance into the motor car manufacturing field in an extensive way, the entire stock and business of the American Motor Co., of Eau Claire, Wis., has been purchased by Ralph M. Burdick, president, and C. W. Vandewater, a stockholder. The company has been manufacturing marine engines for many years, and a short time ago Mr. Burdick started the manufacture of motor cars of his own design. It has been found

successful and will be made the feature of the business. The first car made is a 50-horsepower six-cylinder machine called Burdick's Greyhound.

Doubles Force—Orders have come in so fast at the Kneeland Gasoline Engine Works at Battle Creek, Mich., that within the last 10 days it has been necessary to double the force of operatives.

New Agencies in Washington—Three new agencies have just been placed in Washington, D. C. The Pope Automobile Co., of Washington, gets the Oldsmobile; the Brush-Nichols Co., the Oakland, and the L. P. Dorsett Co. the Stoddard-Dayton.

Buick Hiring More Help—Announcement has been made by the Buick Motor Co. that 1,000 men will be put at work as fast as they can be secured. The company has representatives in several cities in Michigan on a hunt for men. The present force is 2,000 men.

Many in Palace Show—Seventy-five car makers and nearly 250 accessory exhibitors have contracted for space in the palace show. So great has been the demand for space that the show committee has taken the space used at former shows by the Aero Club of America.

October Pope Report—The report of the receivers of the Pope Motor Car Co. for the month of October shows a continuation of the era of prosperity which the receivers have brought about in the affairs of the concern. By the expenditure of $9,501.47 in the factory and $3,332.54 in the office, the cash balance was increased from $223,614.34 on October 1, to $248,402.01 at the end of the month, or a gain of $24,787.67. In view of general conditions this showing is considered remarkably good.

Unique Show Catalog—Believing that the tone and standing of the show which opens in Grand Central palace, New York, New Year's eve, is best maintained by the publication of a catalog without advertising, and, further, in view of the fact that the association is on record as opposed to catalog advertising, the show committee of that organization has decided to distribute at the show a catalog with the complete list of exhibitors, their spaces and their products, but without advertising of the sort that can be of little interest to those attending the show.

Not Earl Reorganization—Emphatic denial is made that the Petrel Motor Car Co., of Kenosha, Wis., is a reorganization of the defunct Earl Motor Car Co., of that city, as was stated in last week's issue of Motor Age. The new Petrel company, at the head of which is Samuel W. Watkins, founder of the Beaver Mfg. Co., has secured the former plant of the Earl, but there the connection ceases. Motor Age was misinformed in the matter, an investigation proving that the new company is in no way connected with the defunct concern. The Petrel company is now busily engaged in the production of its new models which will be offered for public inspection in a short time.

Bought by Burn—Lockwood Brothers, of Jackson, Mich., have sold their garage business to B. M. Burn, formerly with the Buick Motor Co.

Brewster in the Trade—Announcement has been made that the general American agency—at least for the eastern section of the country—for the Delaunay-Belleville cars, has been taken by Brewster & Co., the well-known carriage house, of Broadway and Forty-seventh street, New York city. The placing of the agency is through the efforts of L. I. Mann, one of the directors of the Delaunay-Belleville, who has been in America for several weeks in the interest of the car.

Will Represent A. L. Co.—The American Locomotive Co.'s product will be handled in Minneapolis and the west during the coming year by the Victoria Motor Car Co., a new concern composed of Minneapolis business men, Charles H. Robinson, Arthur W. Armatage and Robert H. Rose. This firm will have over 7,000 feet of floor space to handle its business, being located at 1312 Hennepin avenue. This company is the extreme western representative of the American Locomotive Co. and will handle the line throughout the western states clear to the coast.

Washington Changes—Lester D. Moore, Jr., Premier and Reo agent in Washington, D. C., has leased for a term of years 829 Fourteenth street, N. W., and after extensive improvements will remove from his present location, 814 Fourteenth street. He will operate a garage as well as a salesroom. Extensive improvements are under way in the salesroom of the Pope Automobile Co. Its 1909 line will consist of the Matheson, Pope-Hartford, Pope-Tribune and Waverley. The Auto Car and Garage Co. has opened a salesroom and garage at 632 L street, N. W., and has taken an agency for the Crawford.

Building Motor Mart—Robert J. Randolph and Harold Vorce, who run the Minneapolis branch of H. Paulman & Co., handling the Pierce-Arrow, are so impressed with the possibilities of the future that they have gone into an extensive realty proposition in Minneapolis creating a new Motor Mart on First avenue and Tenth street. They have arranged for the erection of a $100,000 building with a 99-year lease of this very desirable site. Plans are being prepared and building operations will commence at once with the determination of having the building complete and ready for occupancy by February 15 next. The building will provide room for four or five stores. Already the Bingham-Jordan Auto Co., the Franklin agent, has leased one of the larger stores and several other tire and accessory firms are figuring at the present time for quarters in this new trade center. The building will have a frontage of 100 feet on First avenue south, one of the principal business thoroughfares, and 159 feet on Tenth street. The Pierce-Arrow will have the corner store.

Gets Buick Agency—W. G. Wilbon, formerly manager of the Bellefield Motor Co., of Cincinnati, has resigned that position to take the Cincinnati agency for the Buick.

From Hartford to Boston—Edwin Graham, Buick salesman for the Miner Garage Co., of Hartford, Conn., has severed his connection with that concern and joined the sales force of the Buick Boston branch.

Finishes a Truck—The Wisconsin Automobile and Supplies Co., of Two Rivers, Wis., has completed its second motor truck, which is of the friction-drive type. After the truck is perfected, the company will carry on the manufacturing business on an extensive scale.

New Moline Deal—President W. H. Van Dervoort, of the Moline Automobile Co., of East Moline, Ill., has entered into a contract with Otto C. Owen, state representative of the Reo car, whereby Owen will handle the Moline line in Illinois, with the exception of a few counties.

New Cleveland Board—At a meeting of the board of directors of the Cleveland Motor Car Co., held at its offices, 1659 Broadway, New York city, the following officers were elected for the ensuing year: President, James Laughlin, Jr.; vice-president, James Laughlin, 3rd; general manager, James B. Strawbridge; secretary and treasurer, Sydney H. Veal.

Hamlin Builds New Garage—R. C. Hamlin, Franklin dealer at Los Angeles, has under construction a salesroom and garage. the building will face on Olive street. Besides the 65 feet frontage on Olive street by 165 feet deep, the building will have a 40-foot frontage on Twelfth street by 60 feet deep, making it T-shaped, and entirely free from posts. This construction also permits a double entrance. The salesroom with an area of 2,500 feet will be finished with maple floor, beamed ceiling and 4½ feet wainscoting with plate rail for pictures. The rest of the building will be used as a garage and shop for Franklin cars exclusively.

Appersons Enlarging—The Apperson Brothers Automobile Co., of Kokomo, Ind., announces that the increased column of its business now necessitates again enlarging its plant. Plans have already been accepted for the construction of a large three-story building, which will add 50 per cent to the present available factory floor space. Work on this addition will be commenced at once and pushed to completion. Although the company already owned sufficient available land for the new structure, it has recently purchased additional adjoining ground that can be so utilized as to allow of practically again doubling the size of the plant if this is necessary at a later date.

Development Briefs

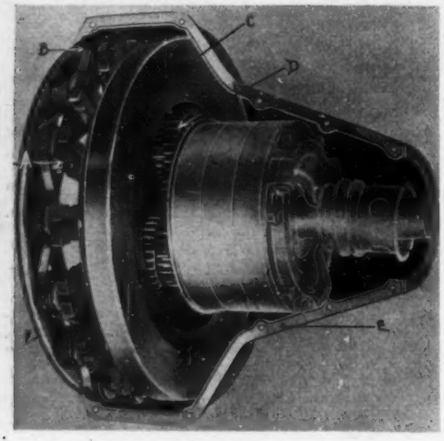


FIG. 1—FORD FLYWHEEL MAGNETO

IN the Ford 20-horsepower model T car for 1909, the company uses Henry Ford's new magneto, one of the most important features of which is that it is carried on the flywheel of the car and designed to be a fool-proof ignition apparatus, being without commutators, loose wires, brushes, contact points, gears, or other moving parts, with the exception of the permanent magnet. It generates an alternating current and is based upon the theory that, as in any alternating current generator, as the field revolves the magnets cut through the lines of force through the pole pieces of the stationary armature coils and sets up in these coils a current which is taken off at the terminals. In Fig. 1 the Ford magneto is shown complete. On the flywheel C which carries several gears of the planetary gearset are sixteen hairpin-shaped permanent magnets A, regularly spaced on a brass ring attached to the face of the flywheel, as shown in Fig. 3, so that a north N and a south pole S come together. These magnets are clamped to the wheel and the clamping nuts and screws prevented from loosening by the locking wires shown.

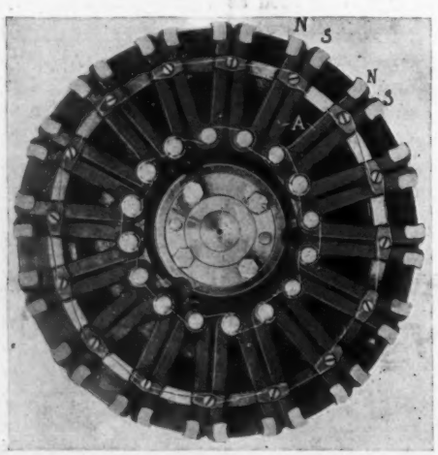


FIG. 3—SIXTEEN MAGNETS IN MAGNETO

Ford Flywheel Magneto

Returning to Fig. 1, there is a coil support F, in the form of an annular piece, also illustrated in Fig. 4, which bolts to the framework E of the engine. Regularly spaced on this framework, seen in Fig. 4, are sixteen coils B, each of heavily-insulated magnet wire, and further insulated by vacuum treatment, in which these coils are placed in an air-tight receptacle from which the air has been pumped, after which an insulating compound is forced into the coil. This treatment is the same as given high-voltage transformer coils, armature windings and field coils by manufacturers of electrical apparatus. These coils are then grouped around the annular support F, and connected in series, being placed so that alternate coils are wound oppositely. One end of the winding is grounded, and the other taken off to the timer on the engine. As the flywheel rotates the magnet poles, north and south alternately, cross the face of the coils, and, as already stated, the electrical current is set up. In an assembly view, Fig. 2, appear many of the parts that go to make up this magneto. At B is one of the sixteen insulated coils; A shows one of the sixteen hairpin-shaped permanent magnets; D is the pole piece for the coils, G, one of the magnet clamps; I, the terminal; C, the brass ring which separates the magnets from the flywheel, and F, H, J and K, bolts and nuts used in connection with the magneto. With this magneto the Ford company does not use an auxiliary system of ignition, not even batteries being carried. On his continued tests of the magneto, Mr. Ford never had one case of its failing to respond; if the flywheel rotates, the magneto must operate.

TUCKAHOE GREASE GUN

Although styled a grease gun, the Tuckahoe, made by the Rubly Mfg. Co., of Tuckahoe, N. Y., also can be used for filling oil receptacles. The feature of this device is cleanliness, which is effected by means of an inner cylinder, which is made of turned brass and which sets into a heavy outer shell, the latter being ⅛ inch larger all around than the inner cylinder. Desiring to use the gun for grease purposes, the inside cylinder is loosened or unlocked by a turn to the left and is withdrawn from the outer shell. Then it is forced into the grease can and is filled with lubricant, after which it is replaced

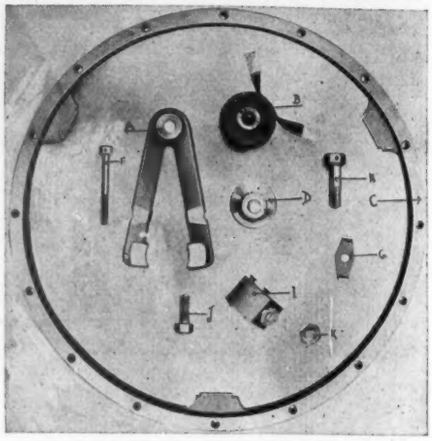


FIG. 2—ASSEMBLY OF FORD MAGNETO PARTS

and is ready for use. In this manner the operation is a cleanly one and even after the work is completed there is a way of getting the left-over grease out of the gun by pushing out the extra matter into the can. Two spouts are supplied, one for oil and the other for grease. If used for oiling, a small nut section latch on the top of the cylinder is drawn out and then the plunger may be worked back and forth with the hand exactly as the plunger of an ordinary syringe. When the nut is disengaged the oils may be sucked up through the nozzle in the usual way and expelled again by forcing the plunger down. When heavy greases are used the nut section is thrown into place, which engages the screw thread on the plunger and then the gun is operated by turning the plunger handle, which forces out the grease with a screwing motion. There are no washers of any kind used on the plunger, which is an accurately-lathed piece of brass which fits the inside cylinder perfectly. It is also claimed that the inner cylinder being protected by the outer shell, the gun is not disabled if it is dented or bruised in any manner.

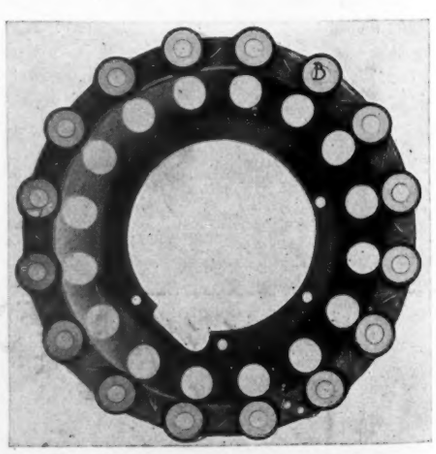


FIG. 4—SIXTEEN COILS OF MAGNETO